MEASURING HUMAN RIGHTS VIOLATIONS IN THE NORTH KOREAN HEALTH CRISIS: A RETROSPECTIVE STUDY

by

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EXECUTIVE SUMMARY

BACKGROUND: North Korea is routinely listed as one of the worst countries in the world in matters concerning humanitarian and human rights. The state has a monopoly over information from the outside and access to information from independent sources such as the internet, and foreign broadcasts are not officially permitted. Freedom of movement, thought, expression and religion has been systematically restricted. North Koreans has been structurally discriminated based on *Songbun,* a state assigned political status based on family background. North Korean institutions and officials have committed political violence such as torture, arbitrary arrest, detention, executions, and forced disappearance.

The totalitarian nature of the political system in North Korea has been preserved in 21st centuries, but a chronic economic crisis coupled with international sanction has led to substantial social changes over last two decades. A rapidly expanding informal market resulted in parallel socioeconomic systems for income and accessing essential items in the most remote areas. Economic inequities newly emerged between politically privileged and disadvantaged groups in the unstable market. In public health domain, the socialist health system was supposed to be scaled back under a chronic funding shortage, leaving informal health market to fill the gap.

Nonetheless, due to political inaccessibility to North Korea, few population-based assessments of the patterns and magnitude of human rights violations exist. While systematic and gross human rights violations have been normalized in everyday life, little is known about whether and how the human rights violations function as significant

determinants of health. Have recent socioeconomic changes resulted in the patterns of human rights violations and, if so, how? What are the mental health consequences of these violations on affected communities? Did political and economic disparities emerge in this transitioning health system and, if so, how? What was the impact of widespread human rights violations on health disparities?

RESEARCH AIMS: The study attempts to address both human rights and public health questions through a cross-sectional, retrospective survey of North Korean refugee and migrant populations, with specific aims below:

- Human rights violation and its social distribution: To describe North Korean refugee and migrants' exposure to human rights violations prior to displacement, and to examine their association with contextual factors such as political and socioeconomic status in North Korea.
- Mental health and human rights: To measure the prevalence of mental health symptoms among North Korean refugees and migrants in South Korea, and to examine their associations with human rights violations in North Korea and other factors related to displacement and resettlement.
- Health system and human rights: To describe health service utilization experience of North Korean refugees and migrants prior to displacement, and to examine their association with human rights violations and other contextual factors such as political and socioeconomic status in North Korea.

METHODS: Between August 2014 and January 2015, we conducted a cross-sectional survey using respondent-driven sampling among 383 adults (≥ age 18) North Korean

refugees and migrants resettling in South Korea during the last five years. Data on human rights violations were collected using a human rights violation inventory (HRVI-NK). Symptoms of PTSD, anxiety and depression were measured using the Harvard Trauma Questionnaire and Hopkins Symptom Checklist along with other psychosocial factors related to resilience. Self-reported morbidity and access to health service were collected with details of health service utilization experience of illness episodes prior to displacement. Political, economic, and demographic profiles were obtained along with other factors related to forced migration. Descriptive analysis was carried out to detail patterns of human rights violations, mental health, and healthcare utilization with RDS-adjusted estimates using RDSAT 7.1. Multivariate logistic regression models were used to determine multiple associations of human rights violations with political and economic factors, mental health status and self-reported morbidity and healthcare access, after adjustment for key variables of interests and other social-demographic factors in pre-migration, peri-migration, and post-migration.

RESULTS:

Manuscript 1. Social distribution of human rights: Our findings indicate that 89.8% (CI: 86.1-93.5) of participants experienced political and civil rights violations, and 83.8% (CI: 78.5-88.2) experienced social and economic rights violations in North Korea. Almost all respondents witnessed those human rights violations in their communities: 63.8% (CI: 57.3-69.5) experienced a denial of the rights of freedom of thought, expression, and religion, and 49.1% (CI: 42.1-53.9) experienced structural discrimination. 74.6% (CI: 68.4-80) of respondents did not enjoy a freedom of movement and residence, and 29.3% (CI: 24.7-35.2) suffered torture and inhuman treatment. More than half suffered from

inadequate access to food (66.8%, CI: 60.1-73.1) and healthcare services (53.3%, CI: 46.7-60.2), and their livelihoods were threatened by state actors (49.5%, CI: 41.9-56.1). 70.3% (CI: 64.3-75.9) reported forced labor. Lower household wealth (lowest vs. highest quintile) was associated with a wide range of political and civil rights violations, especially torture (Adj.OR=4.4, $p<0.001$) or other physical violence by police or security agent (Adj.OR=3.5, $p<0.05$), political discrimination (Adj.OR=4.4, $p<0.05$), family separation (Adj.OR=8.4, $p<0.001$), political persecution due to suspicion of loyalty (Adj.OR=5.9, $p<0.01$), misconduct of family (Adj.OR=6.3, $p<0.05$), or being target of ideological criticism (Adj.OR=5.3, $p<0.01$), imprisonment (Adj.OR=2.7, $p<0.05$), disappearance of family member (Adj.OR=8.2, $p<0.001$), as well as social and economic rights violations especially life-threatening starvation (Adj.OR=9.1, $p<0.001$) or forced labor (Adj.OR=3.4, $p<0.05$). Lower *Songbun* (hostile vs core status) was significantly associated with political and civil rights violations, especially discrimination based on political status (Adj.OR=18.8, $p<0.001$) or gender (Adj.OR=6.1, $p<0.001$), political persecution due to political misconduct of family members (Adj.OR=7.2, $p<0.05$) and violations related to arbitrary arrest disappearance and detention (Adj.OR=5.9, $p<0.05$). Respondents who worked at informal markets (*Jangmadang*) were more likely to report political and civil rights violations especially restriction of travel (Adj.OR=2.0, $p<0.05$) or residence (Adj.OR=2.7, $p<0.001$), political persecution due to political opinion (Adj.OR=4.4, $p<0.05$) or suspicion of loyalty (Adj.OR=4.4, $p<0.05$), being target of ideological criticism (Adj.OR=3.4, $p<0.001$), as well as social and economic rights violations related to food (Adj.OR=2.7, $p<0.01$), livelihood (Adj.OR=2.7, $p<0.001$), forced labor (Adj.OR=2.1, $p<0.05$).

Manuscript 2. Mental health and human rights: The study provided data on the elevated symptom scores of anxiety (60.1%, CI: 54.3-65.7) and depression (56.3%, CI: 50.8-61.9), and symptom criteria for PTSD (22.8%, CI: 18.6-27.4) among North Korean refugees and migrants. Psychiatric symptoms were not only associated with traumatic events such as rape, human trafficking, or natural disaster, but also with the systematic denials of political and civil rights (Anxiety Adj.OR=15.64, P<.001; Depression Adj.OR=11.51, P<.001; PTSD Adj.OR=17.34, P<.05), and social and economic rights (Anxiety Adj.OR=5.09, P<.001; Depression Adj.OR=3.78 , P<.01; PTSD Adj.OR=5.07, P<.05). Household wealth in North Korea was associated with more symptoms of depression (Adj.OR=4.77, P<0.01) and PTSD (Adj.OR=5.33, P<0.01). Trust with generalized others and social engagement were significant resilience factors that were associated with lower symptoms of depression (Trust Adj.OR=0.63, P<0.01; Social engagement: Adj.OR=0.59, P<0.001), PTSD (Trust: Adj.OR=0.65, P<0.05; Social engagement: Adj.OR=0.69, P<0.05), and anxiety (Social engagement only: Adj.OR=0.65, P<0.01).

Manuscript 3. Health system and human rights: The study highlights inadequate access to health service in informal health markets. Of the 62.9% (CI: 57.8–67.7) of respondents who had an illness within one year prior to displacement, only 37.7% (CI: 30.6–44.3) accessed to health services. This appears to be mainly due to informal medical costs and bribes (53.8%, CI: 45.1-60.8) and a lack of medications and medical supplies in health facilities (39.5%, CI: 33.3-47.1). Informal market (*Jangmadang*) were main income resource for paying medical costs (47.3%, CI: 40.4-55.3) but also places for purchasing medicines and medical supplies (pharmacies: 60.5%, CI: 53.2-66.9; street stalls: 42.5%, CI: 35.8-49.9). High utilization of narcotic analgesics (53.7%, CI: 45.7-61.2) and

methamphetamine (2.7%, CI: 0.3-6.2) were found in the informal health market. Political and civil rights violations were strongly associated with increased odds of self-reported morbidity (Adj.OR=8.88, p<.001), and decreased odds of healthcare access (Adj.OR=0.20, p<.01), especially discrimination (Morbidity OR=1.90, p<.01; Healthcare access OR=0.61, p<.05), restriction of movement and residence (Morbidity OR=3.18, p<.001; Healthcare access OR=0.46, p<.01), denials of freedom of thought, expression and religion (Morbidity OR=1.88, p<.01) and arbitrary arrest, disappearance and detention (Morbidity OR=2.47, p<.001; Healthcare access OR=0.39, p<.001). Social and economic rights violations were also associated with morbidity and healthcare access, especially rights to livelihood (Morbidity OR=4.60, p<.001; Healthcare access OR=0.34, p<.001) and forced labor (Morbidity OR=2.08, p<.01; Healthcare access OR=0.46, p<.01), and food insecurity (Morbidity OR=2.33, p<.001; Healthcare access OR=0.24, p<.001). Also, lower household wealth was statistically associated with poor healthcare access (Adj.OR=0.29, p<.01), while a membership of Worker's Party of Korea was associated with better healthcare access (Adj.OR=3.07, p<.001). Those who were engaged in black market works were more likely to report morbidity (Adj.OR=2.28, p<.001) and less to healthcare access (Adj.OR=0.30, p<.001).

CONCLUSION: Our retrospective study confirms widespread, gross, and systematic human rights violations in North Korea that have been evaluated almost entirely in a qualitative manner to date. Findings indicate that human rights violations are disproportionally distributed by political and economic inequalities. The pattern of human rights violations among individuals was significantly associated with changing inequalities and power imbalances in terms of access to the political, social, and

economic resources necessary to promote human rights or prevent human rights violations. Efforts aimed at reducing human rights violations should be addressed for millions of survivors inside North Korea.

This study also suggests that systematic and widespread human rights violations need to be considered as political determinants of mental health in affected communities. Psychiatric symptoms were not only prevalent among respondents who experienced traditional traumatic events such as torture, rape, or starvation or death of a family member, but also among those who had suffered from human rights violations related to freedom of movement, freedom of thought and expression, or rights to livelihood. These findings may challenge the traditional understanding of refugee health that has paid more attention to the traumatic experience of forced migration than political and social determinants of health that had been embodied prior to displacement. Policy makers and health professionals need to pay more attention to human rights situations in regard to mental health determinants in vulnerable populations and to adjust human rights frameworks for public health interventions.

Lastly, this study provides new data on health service utilization in the recent informal market transition of the health system in North Korea. This finding indicates that the socialist health system was scaled back under international sanctions, leaving informal market mechanisms to fill the gap. Health disparities emerged, changing political and economic inequalities and accentuating human rights violations in North Korea. Health system reform, with a new financing scheme, is necessary. The North Korean government

and international organizations should work to reduce health disparities in this transitioning health system.

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I thought, hope cannot be said to exist nor can it be said nonexistent.

It is just like roads across the earth.

In truth the earth had no roads to begin with;

But where many people walk through, a road will be made.

我想, 希望是本無所謂有,

無所謂無的.

這正如地上的路;

其実地上本没有路, 走的人多了, 也便成了路.

- Lu Xun, Hometown

I appreciate the road to reach most marginalized people. I appreciate one nine years old refugee orphan who walked more than 1,000 miles from North Korea, to China, Thailand, to my clinic in South Korea 10 years ago. Since then I could walk in the opposite direction to he came from. His name was '응' meaning 'Yes'.

I appreciate Dr. Courtland Robinson, Dr. Gilbert Burnham and Dr. Keumsoon Lee, who walked the road to North Korean refugee before me. I could walk with a map along the way they walked. I appreciate Dr. Bob Lawrence, Dr. Chris Beyrer, Dr. Pamela Surkan and Dr. Paul Spiegel, who taught me that there are many ways to reach out the globally marginalized population. I also appreciate Jaeshin and Dohoon who helped me to walk

these roads. They are all pioneers to human rights and humanitarian paths across the globe. Hope cannot be said without people like them.

Belatedly, I realize the life had no road to begin or end with. We only have people to walk with. I could see my three parents in the beginning of this road, heartwarming colleagues in the mid, and finally can see one beaver in the end of this road. I appreciate my life, the endless road to reach my people.

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ACRONYMS

CEDAW	Convention on the Elimination of All Forms of Discrimination against Women
CESCR	Committee on Economic, Social and Cultural Rights
CAT	UN Convention Against Torture
COI	UN Commission of Inquiry (COI) on Human rights Violation in Democratic People's Republic of Korea
CRC	Convention on the Rights of the Child
DPRK	Democratic People's Republic of Korea
HRW	Human Rights Watch
HRVs	Human Rights Violations
ICCPR	International Covenant on Civil and Political Rights
ICESCR	International Covenant on Economic, Social, and Cultural Rights
IDU	Injecting drug users
LGBT	Lesbian, gay, bisexual, and transgender
NGO	Non-governmental organization
NK	North Korea/North Korean
PDS	Public Distribution System
PTSD	Post Traumatic Stress Disorder
RDS	Respondent Driven Sampling
ROK	Republic of Korea
SSD	State Security Department
SES	Socioeconomic Status

SK	South Korea
UNHCR	Office of the United Nations High Commissioner for Refugees
USA	United States of America
WFP	World Food Programme
WPK	Workers' Party of Korea
WHO	World Health Organization

1 Introduction

1.1 Contextual background

1.1.1 Social changes and forced migration after great famine

Twenty years ago, the collapse of the socialist economy, together with natural disasters, caused one of worst cases of famines in recent history, resulting in widespread human suffering and substantial population displacement in North Korea.[1, 2] Post-socialist transitions of the former Soviet Union and other communist countries had led political and economic isolation of North Korea in the 1990s. Food production was diminished along with poor agricultural infrastructures and seriously aggravated by series of natural disasters such as a hurricane, floods, and a drought. These culminated in the 1995-1998 famine. North Korean government had to reduce food rations down to less than 60 grams per day especially in the northeastern area of North Korea, which had always been the most marginal.[2-5] Crude death rate rose to 42.8 per 1000 in 1995-97.[2]

Under chronic economic distress, the Public Distribution System (PDS) continuously failed to provide minimum amounts of essential items such as food and medicine.[3] It led to substantial social system changes, particularly through the expansion of informal market mechanisms in past two decades.[4, 6] One of the most significant phenomena was the sharply expanding local market outside PDS called as *Jangmadang*. As a part of significant market reforms in 2003, farmers' markets were introduced and held three times a month.[4] This local market improved efficiency of production, distribution, and consumption of non-staple but essential commodities, such as vegetables, potatoes, and green maize from kitchen gardens. Under the malfunctioning influences of the PDS, people relied on informal market functions of food production and distribution.[4] The

farmers' market provided an important source of food in local communities which were marginalized from the central food ration system.[7]

Faced with a chronic funding shortage, furthermore, the North Korea government sharply decreased health expenditures. The socialist health system was carefully developed during 1960-80s and provided comprehensive health care through an extensive network of health facilities with 50,000 section doctors and 215,727 health staffs in North Korea.[8, 9] The socialist health system was scaled back since the 1990s.[8, 10] Although total expenditure on health is increasing from 5.9% of GDP in 2000 to 6.1% in 2010, a 67% funding deficit was still found in prioritized health services in 2013.[11, 12] Critical shortages in essential medicine, medical supplies, and logistical costs were observed in the findings of international organizations.[11] Under the socialist health system, a rapidly expanding market mechanism resulted in a parallel private health system outside government control which accessible in local markets in the most remote areas.

Another significant phenomenon in this socio-economic transition is the high number of North Koreans fleeing to China. Before the famine in the 1990s, North Korean government controlled all aspects of their citizens, and even before the famine, prohibited domestic travel without permission. The famine triggered numerous border crossings, especially along the northeastern border of China.[13, 14] During the early phase of this displacement, it was merely a kind of circular migration without settlement; people would flee for short periods to get assistance from their *Josunjok* (ethnic Korean Chinese) relatives living in the area along the Chinese border, bringing back home food, money, and medicine[13]. However, these early returnees whether forcibly repatriated or not, also

brought back relevant information and established networks, provoking other border crossings. As smuggling networks became established around the border in the late 1990s, circular migration turned into permanent displacement to China, especially to the *Yanbian* province--a *Josunjok* ethnic area near the China-Korea border. [15]

The smuggling of North Koreans was not only triggered by socioeconomic instability inside North Korea but also by the demand of North Korean brides for rural Chinese men. [15] In rural China, recent rapid urbanization and female migration into cities have aggravated the existing imbalance of sex ratio in rural areas. In this growing shortage of females, smuggling networks, which were established between North Korea and China after the Great Famine, have functioned as the initial entry of process into human trafficking. However, since the Chinese government has not made efforts to protect these women and have forced repatriation on these women, regardless of their experience in trafficking.[16] This has resulted in all cases of trafficking survivors being labeled as illegal migrants and deported, only to be met by numerous traffickers and re-trafficked back to China to be re-sold and further victimized.[17]

Even though this displacement was the unavoidable result of severe famine and human trafficking, illegal border crossers were regarded as traitors, and hence, severely punished.[18] Those who forcibly repatriated to North Korea shall be imprisoned no less than seven years based on the 1987 North Korean penal code (article 47). With the improvement of the crisis period, the penalties were gradually lightened into labor training camps (*Rodongdanryeundae*), but still severe in general.[19] Furthermore, some North Koreans were identified as “risk groups,” when they had been supported by

religious groups or foreign NGOs in China, and considered as security threats to the North Korean regime. Those identified were punished by being sent to a political prison camp or by death.[20]

In this context, many North Korean refugees have moved to South Korea where its citizenship are automatically granted under the South Korean constitutional law. North Koreans are protected as a South Korean citizen under the "special law on the protection of defectors from the North" without a process of refugee status determination. North Korean refugee population can be thus heterogeneous by primary reasons of displacement, and possibly mixed with migrant population who mainly moved for economic motivation or family invitation without specific reasons related to refugee definition: "*a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion"*.[21] They are called as "*Talbukja*" (person displaced from North Korea) or "*Saeteomin*" (new settler) in South Korea. The number of North Koreans arriving in South Korea is constantly increasing and has reached more than 26,124 by the end of 2013.[22]

Figure 1.1 shows the general process of displacement and resettlement of North Korean refugees. Once a North Korea refugee applies for asylum in Southeast Asian countries or China, the South Korean government, principally the Ministry of Foreign Affairs negotiates with host countries to make or permit temporary shelters. North Korea refugees must go through a joint interrogation by related ministries and the National

Intelligence Service when they arrive in South Korea. They are then sent to the resettlement support center for North Korean Refugees called *Hanawon* and should stay for approximately three months. *Hanawon* provides health screening and service, cultural orientation and job training. North Korean refugees resettle in South Korean communities following by the random allocation of public housing by drawing lots. After being resettled in communities, one protection officer, mainly a police officer, is allocated for each North Korean refugee for general protection and monitoring. Each refugee is eligible for housing, initial financial support, and basic social services.

1.1.2 Human rights violations in North Korea

The International Covenant on Civil and Political Rights (ICCPR) and International Covenant on Economic and Social Rights (ICESCR) were ratified by the North Korean government in 1981. North Korea has also ratified Convention on the Rights of the Child in 1990 as well as Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) in 2001, and cannot be free from the Convention against Torture and Other Cruel, Inhuman, or Degrading Treatment or Punishment of UN General Assembly in 1984. All North Koreans, as human beings, retain all of the fundamental rights from civil and political rights to economic, social and cultural rights. Under international laws, North Korea must refrain from interfering with or curtailing the enjoyment of human rights (*Duty to Respect*); protect individuals and groups against human rights abuses (*Duty to Protect*); and take positive action to facilitate the enjoyment of basic human rights for all members of society (*Duty to Fulfill*).[23] Table 1.1 shows a list of human rights obligations in North Korea.

Despite ramifications of human rights treaties, North Korea has been described as one of the world's most oppressive regimes.[24, 25] North Korean authorities have systematically neglected human rights obligations under international human rights law. A series of UN reports and international NGOs expressed concerns on human rights violations in North Korea.[15, 20, 24, 26-29] Extreme forms of political and civil rights abuse in political prisons have been regularly reported.[25, 29, 30] Some reports focused on forced deportation and increasing protection needs of North Korean refugee situation in China.[16-18] Also food shortages were often reported as systematic human rights violations.[3, 13] In 2013, the United Nation's Human Rights Council established the Commission of Inquiry on Human Rights in the Democratic People's Republic of Korea (hereafter, the Commission of Inquiry, or COI) to investigate the systematic, widespread, and gross violations of human rights in North Korea. Regionally human rights reports have continued especially in South Korea. Since 1996, Korean Institute for National Unification has published series of White Paper on Human Rights in North Korea every year.[19, 31] Regional human rights NGOs such as Citizens' Alliance for Human Rights in North Korea, Database Center For North Korean Human Rights (NKDB) published several reports including torture and child rights in North Korea through interviews of North Korean refugees resettled in South Korea.[32, 33]

The UN Commission of Inquiry and other human rights actors have addressed the totalitarian political system in North Korea, which is dominated by a single supreme leader.[34] The state has a monopoly over information inflows from outside, and citizens are isolated each other.[13, 15, 18] Access to information from independent resources such as the Internet, and foreign broadcasts are not officially permitted.[31, 35] Social activities were

always under surveillance by the neighborhood watch system (*Inminban*) so that any political criticism goes undetected in everyday life.[19, 24, 29, 34] Those denials of the freedom of thought, expression, and religion is a violation of ICCPR (Article 18), CRC (Articles 12, 13, 15 and 17) and the UN charter which emphasizes fundamental freedoms for all without distinction as to race, sex, language, or religion.

Furthermore, there have been structural discriminations rooted in the *Songbun* system, a state-assigned social class based on the sociopolitical background of their family. In the *Songbun* system, all North Koreans are categorized broadly into three classes: core (*Heksim)*, basic (also known as *Dongyo* wavering), and hostile (*Jekdae*) class with approximately 51 more specific categories of families.[28, 29, 34, 36] Although these are being rendered more complicated under the influence of changing socioeconomic conditions in recent transitions, *Songbun* have affected one's access to jobs, education, food rationing, residence, and most aspects of people's lives, given the exceptional extent of state control.[34] These structural discriminations are a violation of the Universal Declaration of Human Rights (article 2), ICCPR (Article 2), and ICESCR (Article 2).

Freedoms of movement, thought, expression and religion have been systematically restricted as well.[25, 31] The state has designated forced assignment of residence and employment to their citizens especially based on the *Songbun* system.[25, 31, 34] Also, upon the state's political decision, persons can be deported or banished from their assigned residence and job to remote regions.[19] North Korean authorities strongly restricted domestic and foreign travel without official authorization so that citizens are isolated from contact with each other and with the outside world.[13, 15] Violations of the freedom of

movement and residence are violations of ICCPR (Article 12). In addition, despite the increasing needs for business travel under the recent marketization of basic social systems, this policy is still operated to maintain the control of flow of information and market activities and the criminalized market business of politically marginalized persons for who are it is hard to get travel permission.[37] Given an individual's chance of livelihood in marketization, the freedom of movement is essential for the right to livelihood which is related to ICESCR (Article 6).

In the totalitarian system, North Korean institutions and officials have committed political violence such as torture, arbitrary arrest, detention, executions, and forced disappearance.[36, 38] North Korean have been exposed to arbitrary arrest, and prolonged imprisonment, enforced disappearance to political prison camps without a trial or judicial order particularly in cases of major political crimes.[29, 39] Torture and inhuman treatment is an established feature of the interrogation process in criminal justice systems.[31, 32, 34, 38] Arbitrary arrest, detention, executions and enforced disappearance is a violation of ICCPR (Article 9) and Universal Declaration of Human Rights (article 9). Torture and inhuman treatment are a direct violation of United Nations Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (UN CAT) as well as ICCPR (Article 7).

Regarding rights to food, the North Korean government cannot be free from its violation of obligations on equal distribution of food products during the great famine, although economic crisis and environmental factors such as natural disaster need to be acknowledged. [4, 7, 40] The authorities were responsible for their monopolization of access

to food for privileged groups. [4, 7, 40] The key coping mechanisms for food and health crisis are still under the harsh control of the government by not fully legalizing travels and basic market activities, especially for the politically marginalized persons in the *Songbun* system.[37, 41] It is, therefore, clear that North Korean government has failed in its obligation to use the maximum of its available resources. These are violations of the right to food, and related aspects of the right to life are related to the Universal Declaration of Human Rights (Article 25) and ICESCR (Article 11).

1.2 Public health and human rights

1.2.1 Public health impacts of human rights violations

Prevalence of human rights violations: Despite international efforts made over the last decades, severe human rights violations occur in more than 90% of all countries in the world.[42, 43] Amnesty International provided evidence of torture and other ill-treatment which was committed by state actors in 141 countries between 2009 and 2013.[44] Due to the hard-to-reach nature of human rights victims, the prevalence and characteristics of human rights violations are still difficult to be measured in general population in target countries, but increasing numbers of public health literature have directly addressed human rights violations in key populations such as men who have sex with men (MSM), sex workers, injection drug users (IDUs).[45-49]

In the refugee context, human rights violations and their impacts on people's lives are well-documented in numerous public health literature related to the concepts of refugee trauma.[50-57] For example, one study in 1997 from outpatients at a health clinic in New York reported that 5% of refugees had experienced torture.[58] Another study of outpatients

at a psychiatric hospital in Oslo, Norway found that 70% of male and 31% of female refugee patients had been survivors of torture during 1991 and 1995.[59] A recent study of Iraqi refugees who arrived in the U.S. between 2008 and 2009 found that out of 472 refugees, 36.3% were victims of direct torture, and males were twice more likely to be the victim than females.[60]

Physical, mental health and psychosocial outcomes*:* Numerous public health studies have been conducted to evaluate the mental health consequences of past exposure to human rights violations on those who were forced to migrate as refugees to other countries. These studies demonstrate a high prevalence of post-traumatic stress disorder (PTSD) and symptoms of depression[61-67] as well as multiple traumatic experiences from forced migration,[68, 69] perhaps related to many types of violence. A meta-analysis of 20 mental health surveys from refugee populations found ten times higher prevalence of PTSD in refugee populations than an age-matched subpopulation from general populations in western countries.[70] Also, other negative mental health consequences of exposure to severe trauma have been documented in various refugee contexts.[71-73] Exposure to violence was one of the most significant risk factors for poor mental health among refugee children and adolescent.[50] One mental health study on Guatemalan refugees in Mexico found long-term impacts of human rights violations, traumatic events, and refugee experiences even after 20 years of civil conflicts.[66] Carson and Rosser-Hogan also reported that Cambodian refugees had mental health problems even ten years after their displacement.[74]

In the context of conflict and post-conflict, there has been an increasing amount of

literature that addressed health outcomes of political and other types of violence.[66, 75-81] Lopez Cardozo found mental health problems and impaired social functioning among Kosovo Albanians after the war in Kosovo.[82, 83]Those affected by the Afghanistan war regarding mental health, social functioning, and disability were also found to be poor.[84, 85] A cross-sectional multi-stage cluster sample survey of households in the post-war district of Jaffna District in Sri Lanka reported that the prevalence of PTSD, anxiety, and depression was significantly associated with exposure to war-related trauma and internal displacement.[86] Also, a qualitative study on collective trauma in northern Sri Lanka showed a multi-level ecological association between mental health and conflicts.[87, 88] A recent meta-analysis confirmed that potentially traumatic events such as torture are significantly associated with mental health status of those who exposed to conflict situations and displacement.[89]

While much research has been conducted regarding the role that traumatic events play in shaping the mental health condition, less has addressed the consequences of human rights violations on health. In the DSM-5, stressful and potentially traumatic events (PTEs) have been newly categorized in "Trauma and Stress-Related Disorders," and refer to any event that involves a threat to life or physical integrity of the individual or another person and feelings of fear, helplessness, or terror.[90] Even though all human rights violations can potentially be origins of trauma from a clinical perspective, however potentially traumatic events cannot be fully overlapped with the wider range of human rights violations, such as social and economic rights, freedom of movement and residence, or freedom of thought and expression.

Healthcare Utilization*:* While much research has been conducted on the mental health consequence of human rights violations, relatively less has been devoted to health service utilization of those who are exposing and exposed to human rights violations. In refugee contexts, a few studies found that refugee trauma was associated with health seeking behaviors. For example, Eytan found a statistical association between traumatic experiences and health service uses in Kosovo after conflicts in 1998-1999.[91] Subsequent use of health service was also analyzed in Bosnian refugee population living in Chicago.[92] Nonetheless, in these studies, those suffered by human rights violations in accessing essential health services are not clearly reported.

More comprehensive interactions between human rights violations and low access to health care service have been documented in key populations such as IDUs, sex workers, and LGBT(lesbian, gay, bisexual, and transgender) persons, especially in relation to discrimination and stigma.[49, 93] In India, for example, 47% of IDUs reported a denial of general health services, and 24.2% reported denial of harm reduction services when in need because of fear of discrimination and criminalization.[93] A meta-analysis study on human rights violations against sex workers showed that human rights violations increased risks of HIV and undermined effective HIV prevention and intervention.[45] In recent studies of sex workers, multiple pathways of human rights and health found between police violence and unprotected sex, inconsistent condom use, STI symptoms and STI/HIV infection.[49, 94] Other studies showed an association between institutionalized discrimination and stigmatization of HIV prevention/treatment and other health services.[95, 96]

Human rights as a social determinant of health: Public health literature that directly measured human rights violation as social determinants of health are rarely found. Regardless of the human rights lens, however, public health concerns of social epidemiology are still valid in measuring the health impact of discriminative distributions of socioeconomic status. Even though its association with human rights violations was not commonly documented, these studies investigate the public health outcome of various social and economic determinants that are derived from dynamic political processes, often emerged with systemic human rights violations.[97-101] Global evidence on the social determinants of health gives priority to improving the structural drivers of health and health inequity in the national and international levels, such as inequitable distribution of power, money, and resources, gender equity, policy frameworks, and the values of society.[99, 102] The pathway of human rights violations on health pertains not only to the relationship between individuals and perpetrators but also to complex interactions among individuals and their multi-level environments. A model-of-rights based approach has provided policy and program frameworks for governmental and non-governmental actors to respond inequitable political and social environments that are embodied in various determinants of health.[103-106]

1.2.2 Research gaps in the context of North Korea

Measuring human rights violations in North Korea: There are political barriers to the accessibility of vulnerable population in North Korea. No reliable human rights study has been conducted inside North Korea. Also, it is still rare for the humanitarian actors to do an on-site assessment except for *Pyongyang* and a few selective regions, although there

have been exceptional efforts in recent years, for example, by UNICEF [107] or World Food Program.[5] The UN Commission of Inquiry noted denials of North Korea on their request for on-site investigations, as below:

> *Resolution 22/13 urges the Government of the DPRK to cooperate fully with the Commission's investigation to permit the Commission's members unrestricted access to visit the country and to provide them with all information necessary to enable them to fulfill their mandate. Immediately after its adoption, the DPRK publicly stated that it would "totally reject and disregard" the resolution, which it considered to be a "product of political confrontation and conspiracy."*[34]

In this context, North Korea human rights violations have been documented mainly based on the testimonies of North Korean refugee population outside of North Korea. Especially in South Korea, various qualitative interviews have been done by regional and international actors and used for central evidence for human rights advocacy and implement policies such as international sanction. The UN Commission of Inquiry (COI) confirmed systematic and widespread gross human rights violations in North Korea and justified these qualitative approaches, as below:

> *The Commission bases its findings on a "reasonable grounds" standard of proof. It concluded that there are reasonable grounds establishing that an incident or pattern of conduct had occurred whenever it was satisfied that it had obtained a reliable body of information, consistent with other material, based on which a reasonable and ordinarily prudent person would have reason to believe that such an incident or pattern of conduct had occurred*.[34]

Nonetheless, evidentiary testimony alone has a methodological limitation in providing the full magnitude of human rights problems in North Korea's everyday life. Currently, little is known about the impact of gross human rights violations in North Korea at the population level. Population-based quantification of human rights violations was not common. Also, due to hard to reach nature of North Korean refugees, most of the human rights findings were based on a small convenient sample of the refugee population that was hard to be generalized to the entire refugee population. Selection bias was a challenging problem in both human rights and humanitarian actors which lack direct access to the North Korean population. As a result, there has been a lack of reliable statistics regarding a quantitative aspect of gross human rights violations in North Korea, especially its social distribution on the North Korean population. In epidemiological perspective, the prevalence of various human rights violation was not fully measured even in the North Korean refugee population. It is still unknown whether and how human rights violations are associated with contextual factors such as political and socioeconomic status.

Measuring North Korean health: Physical, mental, and psychosocial health aspects of survivors are not only essential indicators of rights-to-health but also considered as core consequences of human rights violations on people's lives. Despite its strong human rights arguments made in the normative framework, the Commission of Inquiry and other human rights actors failed to pay attention to public health consequences of widespread and systematic human rights violations. Only a few exceptional studies provided scientific evidence on health situation inside North Korea. In his retrospective study of

North Korean refugees in the border, Robinson showed elevated household mortality and declining fertility during the great famine period 1995-1998 through a retrospective study of North Korean refugees displaced from North Korea.[2] In 2012, UNICEF conducted national nutritional surveys based on a cross-sectional, stratified; two-stage cluster survey in North Korea, and reported that stunting prevalence is 27.9% at national level.[107]

In the refugee health domain, the associations with human rights violations were not clear, but there has been an increasing number of publications on the health of North Koreans. These public health literature focused multiple aspects of physical, mental health and psychosocial well-being of those resettling in South Korea. Similar to other studies in humanitarian contexts, symptoms of anxiety, depression, and PTSD were commonly addressed with the traumatic and stressful experience during forced migration.[108-111] Seeking a broader understanding of the mental health problem facing this population, Kim and colleagues found that, in a sample of 144 North Korean refugees living in South Korea, somatization was the most prevalent psychiatric symptom, experienced by 42.4% of the participants.[112] Depression was the second most prevalent psychiatric symptom at 38.9%, but at least 25% of North Korean refugees reported numerous other psychiatric symptoms: obsessive-compulsive disorder, interpersonal sensitivity, anxiety, hostility, phobic anxiety, and paranoid ideation.[112] More recently, long-term mental health outcome data on North Korean refugees have emerged. Specifically, a seven-year follow-up study of 106 North Korean refugees demonstrated that, despite initially high PTSD prevalence rates nearly 29.5% after first defecting to South Korea,[111] the prevalence of PTSD decreased significantly to just 1.9% seven years later.[113] Furthermore, the findings also suggested that the stress experienced by North Korean refugees attempting to acclimate

to a new life and culture in South Korea was a more significant determinant of their current mental health, namely not having depression or PTSD, than prior PTSD symptoms related to living in or defecting from North Korea. Also, the cultural appropriateness of psychological instruments is examined for the North Korean refugee population.[114]

Despite increasing numbers of studies, methodological limitations remain in most public health literature on North Korean refugee populations. First of all, similar to human rights studies, non-probability sampling, such as large snowball sampling or convenience sampling based on service facilities (e.g., hospitals or social welfare centers) were also dominant in public health literature due to the hard to reach nature of North Korean refugees. The prevalence of certain health status was thus hard to generalize to that of the entire refugee population, and may not fully reflect most marginalized groups who were not accessible by peer-network or service facilities. Furthermore, human rights violations in North Korea were not fully identified as explanatory variables in public health outcomes. Political and socioeconomic statuses in North Korea have not been used as key variables or adjusted as potential confounding factors in public health studies.

Also, there are still several research gaps. There are very rare health system researches in North Korea. Rights to health were not addressed in existing public health literature. The interpersonal violence was not commonly addressed in North Korea refugee population. In mental health studies related to North Korean refugees, any mental health and psychosocial services (MHPSS) were rarely evaluated similarly to the most general field of complex humanitarian emergencies.[115] Publications on the evaluations of other social

interventions among the North Korea population were also uncommon. In addition, longitudinal studies were unusual, except on a few psychiatric symptoms of PTSD and depression.[113] A more comprehensive and long-term evaluation is needed on the mental health and psychosocial well-being in this population.

1.3 Research aims and objectives

1.3.1 Problem statement

The UN Commission of Inquiry (COI) confirmed that systematic and widespread gross human rights violations have been and are being committed by North Korean institutions and officials.[34] Nonetheless, population-based quantifications of human rights violations are scarce. The biosocial consequences of human rights violations on survivor's lives are still not properly addressed in human rights literature, and health of North Koreans are left invisible due to their self-imposed and externally-imposed isolation.

This dissertation attempts to provide timely data that document the human rights abuses experience of North Korean refugees and its association with multiple aspects of their lives including mental health, health care utilization, as well as their political and socioeconomic conditions. The epidemiological evidence of human rights abuses and its consequences on health are timely and significant, first of all, to understand the impacts on a refugee population and also because it may offer insights into the population at large.

1.3.2 Research aims

The overall aim of the study is to understand quantitative impacts of gross human rights

violations on its survivor in the given the context of health and forced migration. The study attempts to measure each form of human rights violations that North Korean refugees experienced prior to displacement and to examine its association with multiple aspects of survivors' lives, Given that there is no direct access to the vulnerable population in North Korea, this study focuses on the North Korean refugee population who were recently displaced from North Korea.

The study attempts to address both human rights and public health questions through a cross-sectional, retrospective survey of North Korean refugee and migrant populations, with specific aims below:

- Aim 1: To describe North Korean refugee's experience of human rights violations prior to displacement, and to examine their association with contextual factors such as political and socioeconomic status in North Korea
- Aim 2: To measure the prevalence of mental health problem among North Korean refugees and migrants in South Korea; and to examine their associations with human rights violations in North Korea, and other factors related to displacement and resettlement.
- Aim 3: To describe health service utilization experience of North Korean refugees and migrants prior to displacement, and to examine their association with human rights violations and other contextual factors such as political and socioeconomic status in North Korea.

The descriptive component includes (1) prevalence of human rights violations among North Korean refugees, and (2) their mental health conditions. Additionally, it also aims

to provide on (3) health care utilization in North Korea. The interpretive components explore the associations between human rights violations and other variables of interests identified in the descriptive components, including (1) associations of human rights violations with political and socioeconomic status; (2) association of mental health outcomes with political and socioeconomic status as well as human rights violations. Additionally, (3) health care utilization in North Korea was examined with political and socioeconomic status as well as human rights violations.

1.3.3 Research objectives and hypotheses

Research objective 1: To measure exposures to human rights violations and its association with political and socioeconomic status among North Korean refugees and migrants

- To measure the prevalence of human rights abuses among North Korean refugees and migrants prior to displacement
- To examine the association between human rights violations and political and socioeconomic status in North Korea

Hypothesis 1: Exposure to Human Rights violations (HRVs) are statistically significantly associated with low political and socioeconomic status.

Research objective 2: To measure mental and psychosocial health among North Korean refugees and migrants, and to examine its association with human rights violations in North Korea, in consideration with traumatic events during forced migration, and social stress and resilience factors in resettlement.

- To measure the prevalence of PTSD, depression and anxiety symptoms; and other psychosocial outcomes among North Korean refugees.
- To examine their associations with human rights violations in North Korea in consideration with traumatic events during forced migration, and social stress and resilience factors in resettlement

Hypothesis 2: Poorer mental health statuses are associated with exposure to human rights violations (HRVs) in North Korea.

Research objective 3: To describe health care utilization experience and to examine its association with political and socioeconomic status and exposure to human rights violations in North Korea

- To describe health service access and barriers, and self-reported morbidity in North Korea
- To examine their associations with political and socioeconomic status and human rights violations in North Korea

Hypothesis 3: Self-reported morbidity and poor healthcare utilization are associated with low political and socioeconomic status and more exposure to human rights violations (HRVs) in North Korea.

1.4 Conceptual frameworks

1.4.1 Socio-ecological model: health in the context of systematic human rights abuse

Along with right-to-health instruments that originated from CESCR, the legal principles

of other human rights instruments provide a normative framework to categorize the human rights factors which can potentially influence people's health. However, the pathway of human rights abuse on health is hard to simplify with the normative categorization of human rights obligations. The pathway pertains not only between individuals and perpetrators but also between complex interactions around individuals and their multi-level environments. Understanding how human rights factors in a normative framework impact an individual's health requires that the human rights environment be understood as a dynamic and multilevel framework that produce specific determinants of health.

A socio-ecological model of health provides a comprehensive framework for understand the impact of human rights violations on an individual. In this model, the individual is influenced by a broader institutional and societal context that are each interrelated and inseparable. Bronfenbrenner formulated the socio-ecological model in human development with a dynamic (1) ***process*** between (2) the ***biopsychosocial person***, the individual as a center of gravity; and (3) their ***context*** - the multilevel ecological environments of the *microsystem, mesosystem, exosystem*, and *macrosystem*, with a reflection of (4) ***time***, in which a life history of common experience is shared by the same age groups or generations, etc. [116, 117]

This approach not only conceptualizes the direct impact of human rights abuses on an individual's health but also conceptualizes the social production of health determinants in multiple ecological environments that are critically linked to systemic human rights violations in North Korea. Following Bronfenbrenner's model, the ***context*** factors of

human rights violations can be conceptualized in four ecological environments, as seen below:

- Microsystem: Immediate settings surrounding individuals, such as a pattern of activities, roles, and interpersonal relations in a given face-to-face setting.[117] For example, if a North Korean prison cell or household is considered as a microsystem unit, the socio-ecological interaction inside the microsystem includes: violent behavior among the peer inmate group; torture and ill-treatment episodes by individual perpetrators, inadequate health care access in illness episodes, forced labor, domestic violence, and familial food support to prisoners.
- Mesosystem: A system of microsystems that involves the linkages and processes taking place in two or more settings such as a school and a small village.[117] In prison, for example, mesosystem includes an inadequate prison health system, overcrowding prisoners, a shortage of nutritional supply, poor hygiene, lack of medicine and medical staff, weakened governance capacity for regional or central prison facilities, lack of (or over-) supervision, decreasing financial capacities to prison, community stigma due to political oppression, and corruption
- Exosystem: The relationship and processes taking place among two or more mesosystems, in North Korea contexts, such as an inadequate criminal justice system, health and food policies, and a poor administrative system for essential services.
- Macrosystem: Consists of the overarching pattern of microsystems, mesosystems, and exosystems characteristic of a given society, which in the North Korean

context includes an economic crisis and ongoing social transitions, political instability of the regime, international aid and international isolation, and a climate related to natural disasters and food shortage.

In the multilevel *context*, a ***biopsychosocial person*** who has various characteristics (e.g., gender, socioeconomic dispositions, experience, knowledge, and skills) is engaged in a complex ***process*** related to human rights violations, which means a dynamic and complex interaction between the individual and the persons, objects, and institutions in his or her immediate external environment.[116, 117] The human rights factors lie in various pathways with multifaceted processes at all levels that include social and economic policies, criminal justice system institutions, communities, living conditions, and social relationships that influence an individual's health. For example, in the context of an ordinary prison in North Korea, inmate groups have various human rights abuse experiences and different physical and mental health conditions, even if their criminal acts are similar to each other. The human rights abuse and its health outcomes are interrelated with different ***biopsychosocial*** traits of each, and change depending on ***time***– during/after imprisonment and ***context*** – the political and socioeconomic changes which can influence the shortage of food and medicine in prison.

The socio-ecological framework also helps structure the analysis of complex hierarchical interrelationships between human rights factors in changing multilevel environments. For example, sentencing and imprisonment in the 1990s traditionally take into account *Songbun* through the judicial process or by extra-legal means.[34] However, recent transformative social changes (*exosystem*) coupled with the economic crisis

(*macrosystem)* have changed social capitals in North Korea. The economic status of the suspect now becomes a more significant resource for preventing potential human rights abuses because it influences the person's ability to bribe the corrupt criminal system when they are sentenced.[34]

1.4.2 Causal diagrams: mental health and human rights in the context of forced migration

To understand quantitative impacts of gross human rights violations on its North Korean refugee survivor, it requires exploring multiple causal pathways between health and human rights violations in consideration with factors related to forced migration. In the research on mental health of refugee children, Reed overlapped two conceptual frameworks of socio-ecological model and forced migration model , and identified key variables of interests including exposure to violence, history of physical, psychological or developmental disorder, time since displacement, age and sex, family composition, household socioeconomic circumstances, community integration, premigration residence, ideological and religious contexts.[50] Given the conceptual framework of forced migration, someconfounding factors needs to be identified with the socio-ecological models in pre-migration (country of origin), peri-migration (displacement) and post-migration (host country). To bridge these two conceptual models in our study, we identified key socio-ecological variables within the conceptual framework of forced migration (Figure 1.2). (1) *Pre-migration* factors: a range of human rights violations are identified with demographic, political and socioeconomic status in North Korea. (2) *Peri-migration* factors: traumatic events related to displacement on the North Korea border and in China are identified with

other variables such as time since displacement and type of displacement. (3) *Post-migration* factors: discrimination, social exclusion and other resettlement stresses are identified with socioeconomic status in South Korea (Figure 1.2).

These conceptual frameworks were greatly simplified by adopting causal Directed Acyclic Graphs (DAGs). Causal DAGs are based on formal rules for drawing the diagrams and simple and useful device for demonstrating the causal association of key variables implied by complex conceptual models.[118] This study tested the main hypothesis that poorer mental health status is associated with exposure to human rights violations (HRVs) in the adjustment of other *premigration, perimigration* and *postmigration* factors. Furthermore, the study tested another hypothesis that human rights violations (HRVs) are associated with political and socioeconomic status. In figure 1.3, Directed Acyclic Graphs outlined multiple causal associations and potential confounding that were identified in the conceptual framework of the socioecological model and forced migration. Key variables of interests are also identified in the socioecological model in Figure 1.2. Context factors of human rights violations are conceptualized in four ecological environments of *Microsystem, Mesosystem, Exosystem* and *Macrosystem*, following Bronfenbrenner's model and illustrated in Table 1.2.

Figure 1.1 Forced migration flows of North Korean refugees to South Korea

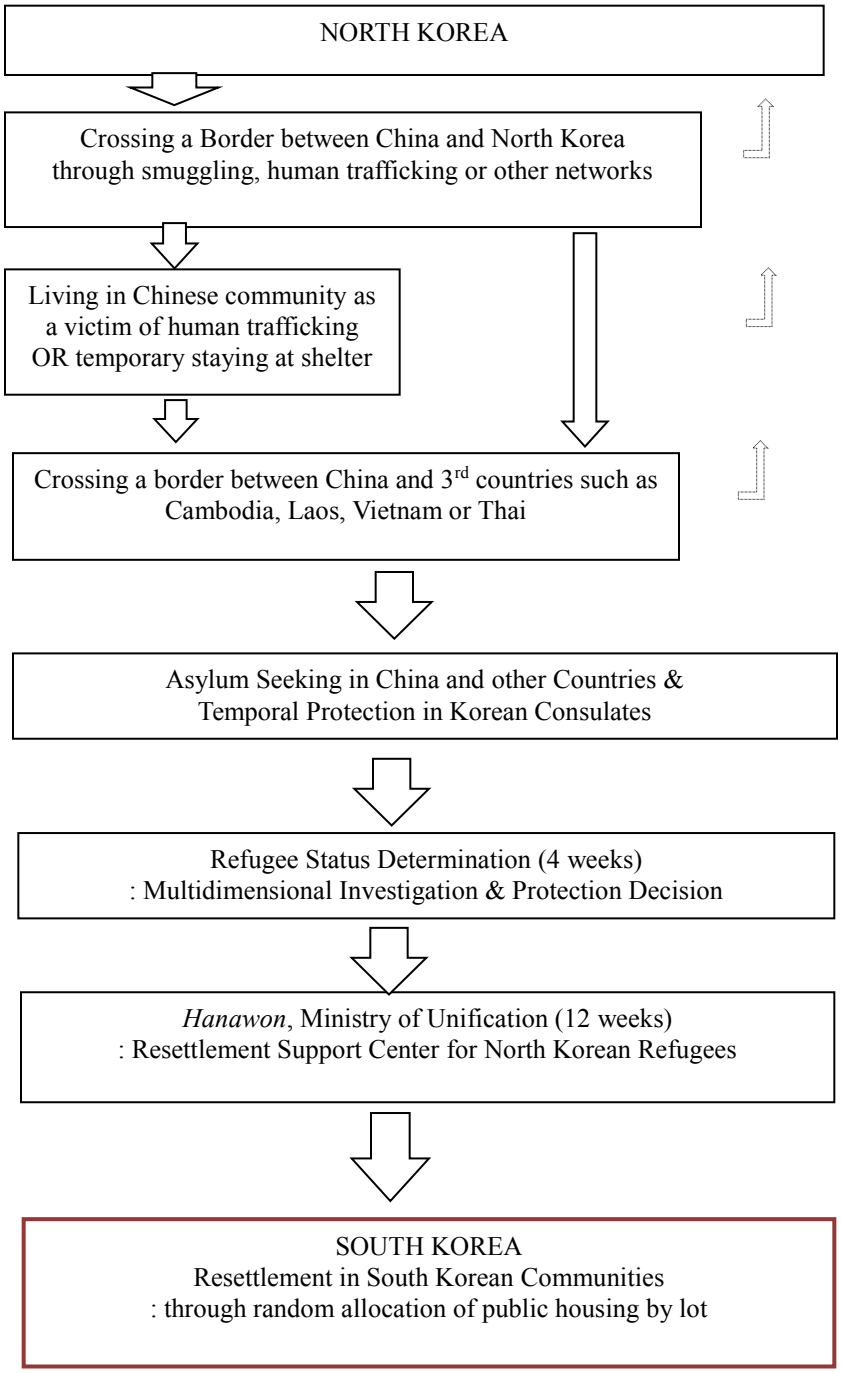


Figure 1.2 Causal associations of variables of interests in socio-ecological model *Hypothesis 1 (*Green arrows*); Hypothesis 2 (*Blue arrows*); Hypothesis 3: (*Red arrows*)

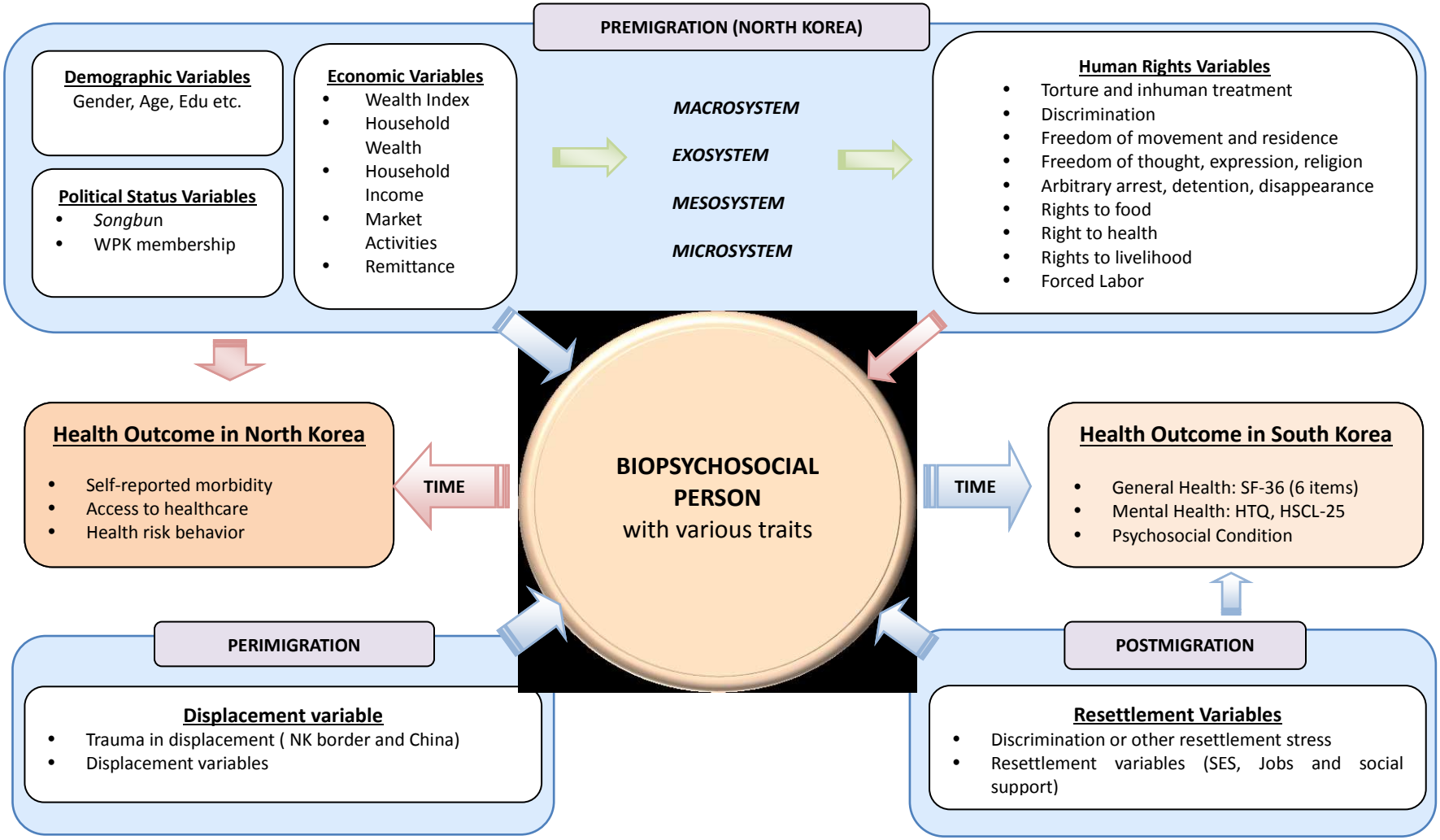
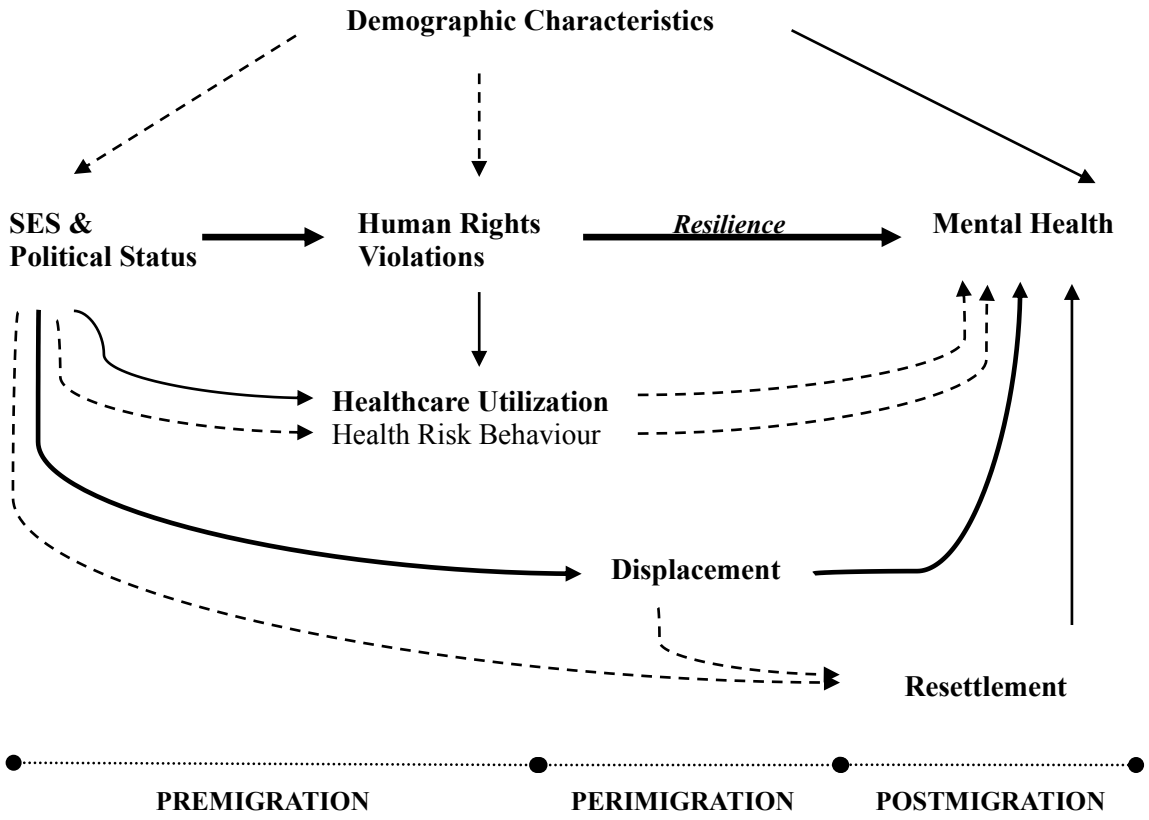


Figure 1.3 Directed acyclic graphs (DAGs) of human rights violation, displacement and mental health of North Korean refugees



***Demographic Characteristics:** socio-demographic factors in NK, Displacement and SK; **Political Status**=political status in North Korea such as Songbun, Korea Labor party membership; **SES**=socioeconomic status in North Korea such as income, wealth and market activity; **HRVs**=human rights violations in North Korea; **Healthcare Utilization**=Healthcare utilization history in North Korea; **Health risk behavior** =Health risk behavior in North Korea such as smoking, alcohol and drug; **Mental Health** =mental health of North Korean refugee in resettlement including depression, anxiety and PTSD; **Displacement** =Perimigration (displacement) factors including displacement history, traumatic events in North Korea border and China; **Resettlement**=postmigration (resettlement) factors including resettlement history, discrimination and other resettlement stress

Table 1.1 Human rights obligations related to health and human rights in North Korea[33]

Treaty Description	Name	Ratification Accession(a)
Convention against torture and other cruel inhuman or degrading treatment or punishment	CAT	
Optional protocol of the convention against torture	CAT-OP	
International covenant on civil and political rights	ICCPR	14 Sep 1981 (a)
Second optional protocol to the international covenant on civil and political rights aiming to the abolition of the death penalty	CCPR-OP2-DP	
Convention for the protection of all persons from enforced disappearance	CED	
Convention on the elimination of all forms of discrimination against women	CEDAW	27 Feb 2001 (a)
International convention on the elimination of all forms of racial discrimination	CERD	
International covenant on economic, social and cultural rights	ICESCR	14 Sep 1981 (a)
International convention on the protection of the rights of all migrant workers and members of their families	CMW	
Convention on the rights of the child	CRC	21 Sep 1990
Optional protocol to the convention on the rights of the child on the involvement of children in armed conflict	CRC-OP-AC	
Optional protocol to the convention on the rights of the child on the sale of children child prostitution and child pornography	CRC-OP-SC	10 Nov 2014
Convention on the rights of persons with disabilities	CRPD	03 Jul 2013

Table 1.2 Positioning human rights impacts on health in multilevel socio-ecological system

	Political Factors	Economic Factors	Torture & Inhuman treatment	Discrimination	Freedom of movement	Freedom of thought & expression	Right to food	Arbitrary detention & Executions
MACROSYSTEM			**No***	**No**	**No**	**YES**	**YES**	**Unknown**
Overall patterns in society/state	*ex) political instability, totalitarianism*	*ex) economic crisis, unstable transition to market economy*	*not directly related*	*not directly related*	*not directly related*	*ex) totalitarian system with single supreme leader*	*ex) famine; economic crisis*	*but partially related to autocracy with political instability*
EXOSYSTEM			**Unknown**	**YES**	**YES**	**YES**	**YES**	**Unknown**
Public Policy Social System Level	*ex) lack of political will for health reform*	*ex) shortage of health budget; collapse of socialist healthcare*	*official policy of torture was not found*	*ex) Songbun system*	*ex) state-designated residence*	*ex) no allowance of free media*	*ex) food distribution policy in famine*	*but legal ground for establishing security departments found*
MESOSYSTEM			**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Organizational/ Community Level	ex) criminalizing market activities	ex) out of pocket money for medication	*ex) no restriction on torture in authorities*	*ex) discrimination for job and education*	*ex) deportation from community*	*ex) secret resident registration file system*	*ex) decreasing food ration to remote area*	*ex) arrested by security departments without trials*
MICROSYSTEM			**YES**	**YES**	**YES**	**YES**	**YES**	**No**
Interpersonal Level	ex) no access to free medication	Ex) Low income level and Lack of medical cost	*ex) physical violence by police*	*ex) education level; poor job*	*ex) restriction on travel w/o permission*	*ex) Inminban (neighborhood watch)*	*ex) food stolen by army*	*not directly related*

* Is it expected to have any direct impact on physical or mental health? OR Is it associated with political, social and economic determinants of health in each level? (Yes/No or unknown)

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2 Research Methods

2.1 Study design

2.1.1 Methodology

A retrospective, cross-sectional survey was used for data collection in 2014-15. The cross-sectional survey consists of respondent-driven sample (RDS) design, given the hard-to-reach nature of the North Korean refugee population in South Korean communities. To reflect recent situations in North Korea, the North Korean refugee population who resettled in South Korea between 2009 and 2014 was initially selected as the source population. The survey was conducted with a structured questionnaire that includes (1) human rights questions identified from the Report of the Commission of Inquiry on Human Rights in the Democratic People's Republic of Korea and other relevant human rights literature as well as from qualitative interviews of 34 North Korean refugees; (2) physical, mental, and psychosocial health instruments; (3) political and socioeconomic background characteristics; and (4) other variables of interest to conduct the assessment of associations between human rights violations and these variables. Also, (5) details in healthcare utilization experience in North Korea were collected. Multivariate logistic regression models were then used to examine the associations between the human rights violations and other variables of interest that were described in the research hypothesis.

2.1.2 Site and study population

The study targeted North Korean refugees who resettled in Seoul, Incheon, and Kyounggi-do in South Korea between 2009 and 2014. The number of North Korean

refugees arriving in South Korea is constantly increasing and has reached more than 26,124 by the end of 2013.[1] This study focused on North Korean refugees in early resettlement period in South Korea when they could be interviewed confidentially and with free and informed consent. This study also limited source population as those who resettled between 2009 and 2014 (see red box table 2.1). Regarding study sites, North Korean communities in Seoul Metropolitan area were selected as initial study sites, given the fact that their regions of resettlement were randomly selected by lot in *Hanawon*. Half of South Koreans (25 million) live in Seoul Metropolitan area which includes *Seoul, Incheon* and *Kyounggi-do*. Most North Korean refugees are resettled following more availability of public housing in this area. The nature of our Sampling method (Respondent Driven Sampling), however, enabled to us to access some North Korean refugees who are not resettled in these regions.

2.1.3 Participant selection criteria

- Inclusion criteria included North Korean refugees 18 years or older who resettled in South Korea from 2009 to 2014. Although resettlement year does not strictly reflect the year of displacement from North Korea, this timeframe gives us an opportunity to study the more recently arrived population, who had lived in the most recent socioeconomic transition of North Korea.
- Exclusion criteria excluded those who declined to consent, and those who could not complete the interview due to physical or mental impairment.

2.1.4 Ethical considerations

Human subjects research issues

- *Enrollment, informed consent and confidentiality*: Prior to the start of the study, researchers and assistants explained the study objectives, meaning, expected time required, potential risks of participating in the study, and that there was no harm or disadvantage in not participating in the study. Individual informed consent was obtained in writing and kept as a study record (see Appendix). Before the study started, surveyors specifically explained study methods such as surveys and interviewing. Each participant received a letter that explained there was neither penalty nor benefit for participating and that it was the individual's voluntary choice to participate or not in the survey. No name was recorded on the questionnaire. Names and contact information of participants were not recorded. There was no way to link a particular questionnaire to the person who filled it out.
- *Benefits for participants*: The results of this needs assessment will be used to inform policy recommendations to improve the negative psychological conditions of North Korean refugees with severe traumatic experience. Respondents who completed the survey or qualitative interview received a small amount of cash reward.
- *Risks/methods to minimize risks*: Every attempt was made to minimize risk associated with this study. The risks and discomforts to participants were believed to have been minimal. There was a risk of possible psychological discomfort that might arise as a result of answering the questions in the survey. Participants were referred to a physician/psychologist in the study team if they wish to discuss their feelings and reactions to the survey questions, and if the participants want, they could be further referred to a regional psychiatrist and

refugee health coordinator. Participation in the survey was voluntary.

- *Participation payment*; Participants received a small reward of KRW 20,000 (around USD 18) for participating in the cross-sectional survey and KRW 80,000 (around USD 70) for qualitative interviews. For the interviewees, an interviewer made the payment directly after the interview. Any information on participation in the study was not shared with others.

Ethical review (IRB approval): The original study protocol was approved by Institutional Review Board (IRB) of the Dankook University in Korea in August 2014. The study was also reviewed as secondary data analysis by the Institutional Review Board (IRB) of Johns Hopkins Bloomberg School of Public Health.

2.2 Study variables and instruments

Based on socio-ecological frameworks of positioning human rights violation on health, the study tried to identify human rights variables and a wide range of independent/explanatory variables, which were potentially associated with the physical, mental health, and psychosocial health of survivors. Variables and relevant instruments were selected to measure the following sectors in a forced migration framework (Table 2.2): Pre-migration (North Korea); Peri-migration (North Korea border, China, and other countries); and Post-migration (South Korea).

2.2.1 Pre-migration: North Korea

Human rights violation inventory in North Korea (HRVI-NK): Most human rights

variables in this study are mapped to existing international normative instruments, including the Universal Declaration of Human Rights (UDHR), the International Covenant on Civil and Political Rights (ICCPR), and the International Covenant on Social, Economic, and Cultural Rights (IESCR), and the Convention against Torture (CAT). Given the inclusive nature of human rights norms, certain human rights violations are not categorized in a single normative framework and are based on more than one human rights instrument.

We reviewed the literature on human rights, including the principal findings of the UN Commission of Inquiry on Human Rights in the Democratic People's Republic of Korea.[2] Qualitative interviews were conducted to collect context-specific information on human rights violations directly experienced by North Korean refugees and migrants. A total of 34 North Korean refugees were interviewed using a semi-structured questionnaire that took 90-180 minutes. The Human Rights Violation Inventory in North Korea (HRVI-NK) was developed with this qualitative information and evaluated through focus group discussions with an expert panel of human rights scholars, NGO workers, a psychiatrist, and refugee health practitioners.

The Human Rights Violation Inventory in North Korea (HRVI-NK) is designed to collect retrospective information on a full range of gross human rights violation in North Korea. A total of 38 items covered individual and community exposures to gross and systemic violations of human rights ranging from political and civil rights (referred to as negative rights) to social, economic, and cultural rights (referred to as positive rights). Political and civil rights were measured with 19 items of five human rights violations (Cronbach

α=0.83). (1) *Torture and inhuman treatment,* as identified by the UNCAT definition of torture: "Any intentional infliction of severe mental or physical pain or suffering by or with the consent of state authorities for a specific purpose" (2 items, α=0.80). (2) *Discrimination*, as determined by questions related to discrimination based on political status and gender, and other unspecified stigma discrimination (3 items, α=0.47). (3) *Freedom of movement and residence*, as identified by any restriction on travel and moving, banishment, and enforced family separation (4 items, α=0.59). (4) *Freedom of thought, expression, and religion*, using questions on religious persecution and political persecution due to political expression or political misconduct of respondents or their family member, enforced surveillance and *Sasang Bipan* (ideological criticism) (6 items, α=0.71). (5) *Arbitrary arrest, forced disappearance, and detention*, identified with questions on imprisonment, forced disappearance, and death in prison, execution of a family member, and public execution (4 items, α=0.56).

Social and economic rights were measured with 13 items of four human rights violations (Cronbach α=0.87). (1) *Right to food*, as determined by three items adapted from the USAID Food and Nutrition Technical Assistance Project (FANTA) Household Hunger (HHH) Survey [3, 4] and two questions related to the experience of life-threatening starvation (5 items, α=0.82). (7) *Rights to Health*, as identified by severe sickness or death without adequate healthcare access and life-threatening exposure to severe cold (3 items, α=0.59). (7) *Forced Labor*, determined by involuntary works for a party or army, in detention or without appropriate compensation (3 items, α=0.63). (8) *Rights to Livelihood* as identified by threatening a critical means of livelihood by the government, or lack of livelihood for survival except for stealing (2 items, α=0.46).

The inventory also measured other traumatic events not committed by state actors with six items (Cronbach α=0.58). It included sexual abuses, rape, human trafficking, bodily injuries due to accident or physical violence, natural disaster, and a missing family due to famine (4 items).

Respondents endorsed individual events with a 10-year recall period according to four options of directly experienced (individual level), witnessed (community level), heard (community level) or not experienced. The human rights variable was characterized as exposed if the respondent answered yes to any of the relevant items, or as unexposed if they answered no in all items. Results based on the dichotomized variables were reported in both individual and community level violations.

Health service utilization and barriers: We asked respondents about experience with health service utilization and barriers in North Korea. First illness episode during the last one year before leaving from North Korea was asked an additional question of whether they received appropriate medical service. Additionally, the same questions were asked about experiences of their family members. On the other section of survey, we include series of survey items in health service utilization items in general, including Health Service Utilization, "were you (or your family member) in need of care but were not able to seek the healthcare service at clinic or hospital?"; Universal Health Coverage, "were you able to get free medication (or other medical service) when you or your family member were ill or injured in North Korea?"; Informal payment, "have you ever given under-table money or gifts to get diagnosis or treatment in clinic or hospital?"

For details in health service utilization and barrier, we included detailed items in both cases of using appropriate healthcare service and not being able to use it in need of care. The experience of respondent and their family were separately asked in 5 years recall period before leaving North Korea, if applicable. Health service utilization question includes following items: Place of illness; Type of healthcare service; Medical cost (diagnosis, operation or others except medication); Medical cost (medication); Other service cost; Bribe; way of paying medical cost; Place to get Medication; Type of Medication; Price of Medication; Symptom or diagnosis. Health service barrier questions included the following items: Place of illness; Type of inappropriate healthcare; Reasons of inappropriate healthcare; Type of self-treatment; Type of self-medication; Total cost of medication; Symptom or diagnosis. Especially we included a drug (*Bingdu)* in the self-medication item given increasing drug abuse in North Korea.

Political status in North Korea

- *Songbun*: In general, the political status of an individual is hard to measure since formal indicators are uncommon in most modern societies, especially after democratization. However, in North Korea, individual political status is systemically measured by one's *Songbun*, a state assigned social class based on family background, which reflects the assumed political loyalty of an individual's family to the DPRK's political system and its leadership.[2] In the *Songbu*n system, all North Koreans are categorized broadly into core (*Heksim)*, basic (also known as *Dongyo* wavering), and hostile (*Jekdae*) with approximately 51 more specific categories. [5] In the survey, given recent socioeconomic

transitions which have blurred strict classification of the three broad classes, *Songbun* was asked with five level items: Very Good (=Core class), Good (≈Basic class), Average (=Basic class), Bad (≈Hostile class), Very Bad (=Hostile class)

- *Workers' Party Korea (WPK) membership*: a membership of Worker's Party Korea is another visible indicator for the higher political status of individual and her/his family. The only person with good political background reflecting family background, occupation, proven political loyalty is permitted to be a member. Also, in turn, a membership of Korea labor party functions as additional political capital to improve persons' political status by accessing better occupations and higher position at work and community. Especially it is necessary preconditions to any future career in public service.[2] In the survey, we asked whether interviewee and/or interviewee's family are a member of Korea labor party.

Socioeconomic status (SES) in North Korea: A family's household income and expenditure, household assets, occupation, and savings are normally useful to measure their household economic condition. During group discussions and pilot interviews with North Korean refugees, however, we found that it would not be easy to measure economic variables because of its transitional characteristics of the North Korean economy, which are reflected in the unstable currency and currency rates, gaps between state-assigned occupations and a real means of making a living, unstable and politically motivated market policies, and rapidly changing household economic conditions. In order to assess household socio-economic status (SES), the study uses multiple strategies with

the survey items:

- *Wealth Index*[6, 7]: Based on principal components analysis (PCA) of a household's ownership of a number of consumer items, as outlined by Rutstein,[6] the wealth index was generated with quintile cut-offs: lowest, second, middle, fourth, and highest. Standardized scores as weights were applied to each asset. Summed scores of each household item were used for ranking the household SES of each sampled individual in one of five quintiles of the Wealth Index. The reliability and validity of the Wealth Index have been demonstrated previously.[7] During the group discussion with North Korean refugees, the list of a household's consumer items was selected following the term *Ojang-Yukgi* (North Korean words that refer to *five pieces of furniture* and *six household electric appliances*), which is considered as an index for household wealth in modern culture. *Ojang (five pieces of furniture)* includes bedding, closet, desk/bookcase, kitchen cupboard, and shoe shelf. *Yukgi* (*six household electric appliances*) includes television, recorder, fan, refrigerator, sewing machine, and washing machine. On top of the 11 items of *Ojang-Yukgi,* 3 items of the generator, mobile phone, and car were added in order to reflect recent trends in household expenditure in North Korea.
- *Household income and wealth* (relative): Household socio-economic status data also rely on the interviewees' perception of overall household wealth and monthly income in comparison with their neighbors and on daily income level (whether it is above USD1 or not). In order to examine the changes of relative household wealth, we asked household SES during the last 1 year while in North Korea and 10 years before leaving North Korea.

- *The black market works and remittance*: We also asked whether respondents and/or household members were engaged in market business (along with items of duration and frequency of market activities) and whether they received remittance from persons outside North Korea (especially from North Korean refugees who resettled in other countries). Given the increasing dependency of an individual's livelihood on market business and remittance, these two items were considered as the main resource of household income.

Socio-demographic characteristics in North Korea: We asked basic demographic data in North Korea except political and economic characteristics. It included a region of residence (where); type of region (urban or rural); and state-assigned job; education level; family information; as well as heights/weights. The region of residence was additionally considered because it was supposed to indirectly reflect political and economic status of respondent's community. In North Korea, there have been extremely different living conditions upon the regions of residence, which were normally being poorer in the more remote area from Pyongyang. The region of residence is designated by state based on one's *Songbun* and other political factors.

2.2.2 Peri-migration: North Korean border, China, and 3rd Countries

Human rights violations and traumatic events in forced migration: In addition to the Human Rights Violation inventory in North Korea, we also identified variables related to traumatic events related to forced migration based on previous studies on North Korean refugees.[8-10] Traumatic events during displacement from North Korea were measured with 19 items, such as lack of food, family separation, arrested by border control, and

having one's life at risk due to shootings in the North Korea border. Traumatic events in China or other third countries such as Thailand were measured with another 19 items, including detention by police or in prison, discrimination based on illegal status, human trafficking, and rape.

Socio-demographic characteristics in displacement: Basic information on their forced migration patterns (when, duration, frequencies) as well as deportation history and the reason for leaving North Korea were collected. Especially we included two items when a respondent left North Korea; and time since the last displacement.

2.2.3 Post-migration: South Korea

Mental health and psychosocial status: The mental health questionnaire consisted of some standard instruments to assess depression, anxiety, PTSD, and social function. PTSD symptoms based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) were measured by the Harvard Trauma Questionnaire (HTQ).[11] The Harvard Trauma Questionnaire was originally developed to screen trauma-related symptoms of refugee populations but has been used and validated in other contexts of conflict and natural disaster.[12-14] We followed a scoring algorithm proposed in the HTQ manual that requires a score of 3 or 4 on at least one of four symptoms of re-experience, at least three of seven symptoms of avoidance and numbing, and at least two of five arousal symptoms.[12, 15] Anxiety and depression were measured the Hopkins Symptom Checklist, a screening tool including 10 items for anxiety and 15 items for depression.[16, 17] This self-report symptom inventory is defined to have a 1.75 threshold score predict anxiety and depression,[11, 18-20] although the optimal threshold score has not been validated in the

context of North Korean refugees. Social function was measured with major six items selected from the 36-Item Short-Form Health Survey (SF-36) that assessed general self-perceived health, bodily pain, role-emotional functioning, and social functioning.[21, 22]

Resilience: We collected information on resilience, referring to the ability to sustain or regain mental health and social function despite significant adverse experience.[23] The complex interplay of biological, social, and cultural factors makes it difficult to measure resilience.[24] We selected four items related to positive adaptation that included self-esteem, self-control, social engagement, and trust in generalized others.[25, 26]

Resettlement stress: We include satisfaction of resettlement services and one inventory of stressful event in resettlement that was developed for identifying stressful events among North Korean refugees in their resettlement in South Korea.[27] Resettlement stress inventory includes socioeconomic discrimination, cultural discrimination, social exclusion and other common stressful events.

Socio-demographic characteristics in resettlement: We first collected basic demographic data such as sex, age, marital status, and children. We included items of whether they have spouse in North Korea for info of marital status; and of whether they have children left behind in North Korea or China, given demographic characteristics of North Korean refugees– in China, there are left behind children born to North Korean women who were married to Chinese men through arranged or forced marriage. In addition, we included items on employment and income. Also, we added an item of whether they get regular governmental aid (living allowance and/or medical aid) in order to measure their poverty status in South Korea. South Korean policies for supporting

resettlement of North Korea refugees include allowance and free medical service for those who are under minimum income level. Lastly we included items on height/weight to compare it with that in North Korea.

2.3 Sampling design: Respondent-driven sampling (RDS)

Preliminary meetings with the relevant government officer, community counselors, and a former psychiatrist who worked at *Hanawon* between September and October 2014 provided qualitative information to decide the details of sampling design in this study. The study of North Korean refugees in South Korea is complicated because North Korean refugees are a hidden population in largely urban settings. North Korean refugees are socially marginalized and often stigmatized in the South Korean communities where North Korea issues are still politically sensitive. Also, more importantly, although many North Korean refugees are successfully resettled in South Korea, there are still ongoing security concerns relating to their families still in North Korea. Left-behind families in North Korea are exposed to strong political stigma which causes social discrimination, police surveillance, and they often are subject to punishments including imprisonment and deportation. These resulted in the hard to reach nature of the North Korean refugee population that hinders the use of standard probability sampling methods. Most quantitative studies of North Korean refugee are based on convenience samples recruited at clinics, social welfare center or community NGOs (venue-based sampling), and often use traditional referral sampling methods such as snowball sampling. Results from such studies are problematic in terms of generalizability to the larger refugee population.[28]

In this study, the Respondent-Driven Sampling (RDS) method was used to obtain a sample of North Korean refugees who have resettled mostly in urban areas in South Korea. The recruitment of samples that are representative of the North Korea refugee population is significant for reflecting the distribution of health and socioeconomic status of its members and for the identification of the most vulnerable population groups in terms of previous exposure of human rights violations. In urban refugee settings, RDS methods have enabled researchers to reach hidden and hard-to-reach groups using a probability sampling approach which produces valid estimates of population characteristics.[29-32]

RDS is similar to chain referral sampling and retains several of its characteristics such as using initial participants to initiate peer recruitment; using peer networks, and relatively easy and rapid recruitment compared to other sampling methods.[33-35] In RDS recruitment protocol, initial respondents (called as seeds) are selected and interviewed. Then coupons (typically less than four coupons) are given to these seeds to recruit others from target populations. These new respondents recruit others in the same manner with coupons. Here incentives are usually given to both of recruiters and new participants. This interview and recruitment cycles (called as waves) are repeated until reaching equilibrium when some key characteristics of respondents are not changed significantly between waves. Social network size of participants is collected in each recruitment. The network referral patterns (who recruit whom) are tracked based upon coupon numbers.[28, 36] When equilibrium is reached, RDS inference methods are then applied to generate unbiased estimates by accounting for social network size of each respondent and recruitment patterns between subgroups.[34, 35]

Traditional chain referral sampling methods commonly have several sources of bias.[35, 37] First, initial survey participants are not randomly selected (*non-random selection of seeds*); and the tendency of people to recruit people similar to themselves (*homophily*) can yield a sample that disproportionately reflects the characteristics of the initial survey participants. Also, certain groups with larger social network size can be over-represented in a final sample since they have more chance to recruit others (*social network size*). Since RDS is designed to reduce these source of bias in traditional chain referral system,[35 37, 38] it has been a preferred method for hard to reach population such as Men who have sex with men (MSM), sex workers, and injection drug users (IDUs).[39-41]

For example, in the recruitment of interviewees, RDS limits the number of peer recruitment by each participant (usually maximum four persons) for more recruitment waves so that the final sample is not biased by the purposive selection of seeds and homophily. Following a Markov transitional probability process, RDS protocols assume that a respondent's characteristics are static (equilibrium) when enough numbers of recruitment waves are reached in a closed system (typically 6 or more waves). Also, in the analysis, RDS estimates are weighted based on collected information of different social network size so that differential probability of selecting each recruit is adjusted. RDS analysis thus mitigates the biases associated with over- or under-sampling of certain groups.[28, 42, 43] In our study, the generalizability of the prevalence estimates was expected to be improved beyond that of other traditional chain referral sampling methods by both of RDS recruitment (e.g. limiting three referrals by each participant) and the analysis methods (e.g. weighting). However, limitations inherent in RDS methods still all apply to this study[44-46], especially for multivariate regression models obtaining correct standard

errors[44-46].

2.3.1 RDS recruitment protocol

RDS protocol comprises two parts of recruitment and inference components. The formative study is recommended to decide on and strengthen implementation details.[42, 47] We decided on the RDS recruitment protocol using information from key informant interviews with North Korean refugees, relevant governmental/NGO workers, health professionals, experts. The following information was considered for the design of RDS recruitment protocol.

Security concern of left behind families: Even in South Korea, North Korean refugees are still hesitant to be contacted by an unknown person because of security concerns of their left behind families in North Korea. Social networks of North Korean refugees in their community are reciprocal. Similarly, their contact information is highly protected in the government and community organizations. Strong trust of recruiter and interviewers with respondents is highly needed. Below are implementation decisions we made given these factors:

- We trained ten North Korean refugees as interviewers to administer a structured questionnaire for participants. Interviewers were recruited based on the experience of administering surveys on behalf of government organizations, research institutes and community organizations, and their trust with local refugee communities.
- Security concerns of participants were highly considered in each interview process: Participants could request to complete the interviews individually or in a

group. Also, participants could specify the location of the interview, either at a private setting (e.g., the participants' home, rented room, or a vehicle) or a common area (e.g., café, church, etc.).

Characteristics of social network*:* The social networks of North Korean refugees are well connected especially among groups who resettled in the same period. North Korean refugees begin to have initial social networks from *Hanawon*, a government center for North Korean refugees where all North Korean refugees should stay for first three months before resettlement. Every month, a group of 70-100 persons (called as *Ki* – class, for example, 107 *Ki* means a class of 107th) arrives at *Hanawon* and stay with other groups which arrived earlier or later. In average, there are 200-300 North Korean refugees staying in this center. During resettlement period, the social networks size of respondents is largely affected by their security concerns on their left-behind family members and current social activities related refugee works. Respondents without security concerns tend to have larger social networks size in the refugee community. Also, North Korean refugees who are working with community organizations (e.g. social welfare center, church or refugee organizations) may have much larger social network size within refugee communities than those who are socially isolated. Below are implementation decisions we made:

- We selected initial seeds from North Korean refugee groups who worked for or were closely engaged in aid organizations or refugee community service. During the formative study, we found that this refugee aid worker groups are relatively proximate to diverse subgroups of North Korean refugees in each community, in

terms of gender, income, age, occupation and resettlement year, etc. We also found their social network are not limited by *Hanawon* class.

- North Korean refugees have settled in major public apartment complexes in two areas of Seoul, as well as in Inchon, Kyounggi-do, and other provinces of South Korea following randomly designated public housing in *Hanawon*. North Korean refugees are networking with other North Koreans living close to their residences. Obtaining access to these different communities is a challenge, in terms of physical distance and community barriers.
- Initial seeds were selected from diverse North Korean refugee communities in Seoul, Inchon, and Kyounggi-do. There are at least 1 or 2 seeds who have social networks in each community.
- Each interviewer was allocated to different refugee communities (e.g., *Incheon, Yangcheon, Nowon and Suwon*) to administer a structured questionnaire for participants in different communities located far away from each other.
- We compensated additional transportation cost for a few North Korean refugees from other remote communities (not from communities in Seoul metropolitan area) who were recruited during RDS waves.

2.3.2 RDS Survey Process

Before starting RDS recruitment, we trained ten North Korean refugee interviewers to administer a structured questionnaire for participants in different North Korean communities which were located far away from each other. In November 2014, initial ten seeds were interviewed with a structured questionnaire that took 60-90 minutes to

complete. We provided three coupons to each seed in order to recruit other eligible participants from their social network into the study (wave one).

When new participants contacted survey team through the contact information provided in the coupon, we arranged a time and location of interview individually. North Korean refugee interviewers in that reason administered the interview with a structured questionnaire. Every new participant that completed the study survey was provided three coupons for further recruitment (wave two). The recruitment waves were repeated until reaching equilibrium (wave nine).

We limited three coupons per each recruiter following recommended RDS protocols.[48] In each interview, we asked about the size of their social network in the refugee community - reciprocal relationship with North Korea refugees resettled in South Korea in last five years. The network referral patterns (who recruited whom) were tracked based upon coupon numbers.

Participants who complained of physical and/or psychological discomfort during or after the interview were referred to a physician/psychologist in the survey team, and if the participants wanted, they could be further referred to a regional psychiatrist and refugee health coordinator. But there were no cases of referrals during our survey.

Recruitment waves were repeated until reaching equilibrium on key variables. Recruitment of the entire sample was completed with 383 individuals. Figure 2.1 visualizes recruitment network in our sample. Significantly, the sex ratio in the final sample without ten seeds of participants was 71.85% women and 28.15% men which are

very similar to the estimated 71.8% women and 28.2% men in the entire refugee population resettled since 1999[1]. Table 2.3 displays socio-demographic characteristics of respondents

2.4 Data analysis

The study was based on review of several analysis protocols for data management and analysis designed for Respondent-Driven Sampling (RDS).[33-35, 43, 49-51] Several estimation methods have been developed and compared with each other, which includes RDS I estimator[52], RDS II estimator [49], RDS-MR estimator[33], RDS-SS estimator [50].For example, in comparison study between RDS I and RDS-II, confidential intervals of RDS II are wider and consistent, and more likely to capture population parameters than that of RDS I, although their point estimates are found to coincide closely, and in small group both are problematic in variance estimation.[53] However it is important to note that the protocol of RDS data analysis and its reliability on statistical inference still lack consensus, in contrast to RDS recruitment protocol which is well established and accepted.[42, 54-56]. McCreesh et al. evaluated RDS by comparing RDS estimates and total population data from an open cohort in rural Uganda; and found RDS I and RDS-II estimators failed to make adjusted estimate better than unadjusted estimates, even though unadjusted RDS sample produced a generally representative sample of total population [42].In particular, the methods of analysis, such as multivariate analysis and handling large variances from RDS adjustment, are still under development. In this study, RDSAT (version7.1), RDS data analysis software (www.respondentdrivingsampling.org), was used for obtaining weighted estimates. Potential biases from differential social network size and homophily

are targeted to be adjusted by weighted data from RDSAT on the basis of the network size and recruitment patterns. Regression analysis did not include data of seeds which were not randomly recruited.

2.4.1 Descriptive components of data analysis

Standard exploratory data analysis procedures were used for exploring descriptive components that involve RDSAT-adjusted and unadjusted (crude) prevalence of each form of Human Right violations and physical, mental health, and psychosocial status (e.g. PTSD, Depression, and Anxiety). Health service utilization and health risk behavior (e.g. drug use) in North Korea are also analyzed. An affirmative response to at least one item within each form of human rights violation identified in variable section (e.g. torture, discrimination, freedom of movement) constitutes exposure to that form of human rights violations.

2.4.2 Interpretive components of data analysis

To identify an important association between outcome and covariates of interests, bivariate analysis between the outcome variables and each of these variables and between the variables themselves in each category of the variable (e.g. socioeconomic status) were undertaken with scatter plots, simple linear and bivariate logistical regressions. Multivariate logistic regressions were adopted as an initial exploration models to examine multiple associations between the outcome and covariates of interests assumed in four hypotheses. The final model of each hypothesis was identified with a forward stepwise selection of variable of interests. Each coefficient and significance of the interaction term

in a multiple logistic regression model examined the contribution of covariates on outcome variables of interest. While RDS adjusted and unadjusted prevalence estimates was used in descriptive analysis, the interpretive analysis presented below use adjusted estimate. The ten seeds were excluded in the regression analysis as well.

Human rights violations and contextual factors (related to Hypothesis 1): bivariate analysis was conducted to test whether human right violations (HRVs) were statistically significantly associated with different political and socioeconomic status and demographic characteristics. Multiple logistic regressions were fit for measuring associations of each form of human rights violation with variables of interests in adjustment of potential confounding.

- *Human Rights Violation*: $\text{Log}\ (p_i /1- p_i) = \beta_0 + \beta_h H_i + \beta_e E_i + \beta_p P_i + \beta_d D_i + \varepsilon_i$

  Where p_i is the probability that each form of human rights violation, E_i is a vector of economic variables; $P_i$is a vector of political status variables, D_i is a vector other demographic variables.

Mental health status (related to Hypothesis 2): Bivariate analysis was conducted to test whether health status is statistically different across individuals with and without experience of each human rights violation (HRV). A multiple logistic regression model was used to examine the associations of each type of health status (e.g., PTSD, Depression, and Anxiety), each form of Human Rights Violations in North Korea as well as the total number of exposures to Human Rights Violations (both of political and civil rights violations and social and economic rights violations) and other traumatic events

during forced migration controlling potential confounding: political, economic and other demographic factors in North Korea.

- *Mental Health Status*: $\text{Log}\ (p_i /1- p_i)=\beta_0 + \beta_h H_i (\beta_f F_i)+ \beta_e E_i + \beta_p P_i + \beta_d D_i +\beta_1 T_i+ \varepsilon_i$

  where p_i is the probability to have elevated mental health symptoms (e.g. PTSD, Depression, Anxiety), H_i is a vector of each form of human rights violation, F_i is a vector of total numbers of traumatic events in Forced Migration (in Displacement – crossing a border, as well as in China and other countries); T_i is a vector of Time (2014 minus year of displacement), E_i is a vector of economic variables; P_i is a vector of political status variables, and D_i is a vector other demographic variables.

Healthcare utilization and morbidity (related to Hypothesis 3):in the same vein, bivariate analysis was conducted to test whether healthcare utilization and self-reported morbidity were statistically different across political, economic and human rights variables. Multiple logistic regressions examined (1) associations of healthcare utilization with exposure to each form of human rights violation and total number of exposures to human rights violations as well as political and socioeconomic status; and (2) associations of self-reported morbidity with exposure to each form of human rights violation, total exposure of human rights violations as well as political and socioeconomic status.

- *Healthcare utilization*: $\text{Log}\ (p_i /1- p_i)=\beta_0 + \beta_h H_i + \beta_e E_i + \beta_p P_i + \beta_d D_i + \beta_{1I} E_i P_i + \varepsilon_i$

  Where p_i is the probability to have experience of not being able to seek the healthcare service in need of care H_i is a vector of each form of human rights

violation and total number of exposures to human rights violations, E_i is a vector of economic variables; P_i is a vector of political status variables, and D_i is a vector other demographic variables.

- *Morbidity*: $\text{Log}\,(p_i /1- p_i) = \beta_0 + \beta_h H_i + \beta_e E_i + \beta_p P_i + \beta_d D_i + \beta_{1I} E_i P_i + \varepsilon_i$

  Where p_i is the probability to have a self-reported illness, H_i is a vector of each form of human rights violation and a total number of exposures to human rights violations, E_i is a vector of economic variables; P_i is a vector of political status variables, and D_i is a vector other demographic variables.

Figure 2.1 Network patterns of 383 RDS recruitments in sample population

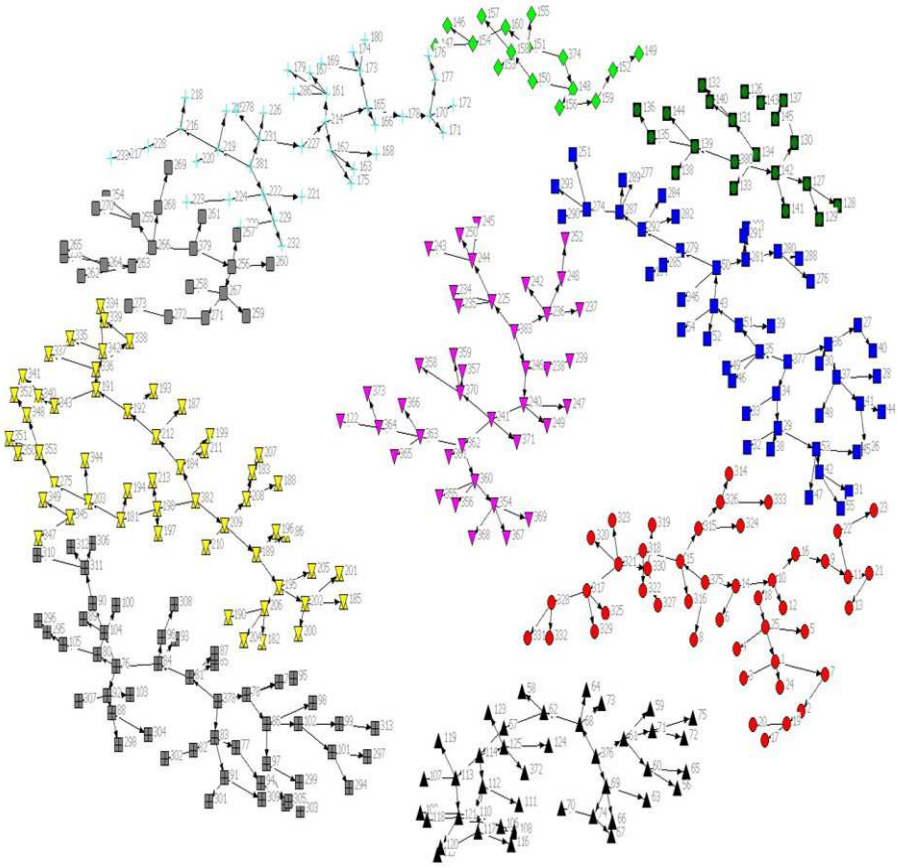

Table 2.1 Number of North Korean refugees resettled in South Korea (-1998 and 1999-2013)

Year	Male	Female	Total	% of Female
-1998	831	116	947	12
-2001	565	479	1,044	46
2002	511	632	1,143	55
2003	472	810	1,282	63
2004	624	1,272	1,896	67
2005	423	959	1,382	69
2006	512	1,510	2,022	75
2007	571	1,977	2,548	78
2008	608	2,196	2,804	78
2009	671	2,258	2,929	77
2010	589	1,813	2,402	75
2011	797	1,909	2,706	70
2012	402	1,107	1,509	73
2013	371	1,145	1,516	76
Sum	**7,949**	**18,175**	**26,124**	**70**

* Boxed area comprises the population of North Korean refugees resettled between 2009 and 2014

Table 2.2 Study variables and instrument

Category	Variables
I. Pre-migration (North Korea)	
Socio-Demographic Factors	1. Demographic profile in North Korea (country of origin)
Political Status	1. Songbun and memberships of Korean Workers Party
Socioeconomic Status	1. SES Variable: Wealth index and household income 2. SES Variable: Market activities and remittance
Human Rights Violation Inventory (HRVI-NK)	1. Discrimination 2. Freedom of movement and residence 3. Freedom of thought, expression and religion 4. Arbitrary arrest, detention, and enforced disappearance 5. Rights to food 6. Rights to health 7. Rights to Livelihood 8. Forced Labor 9. Other traumatic events
Healthcare utilization and barriers in North Korea	1. Health Service utilization and barriers in North Korea 2. Details in health service utilization experience 3. Variables: details in health service barriers
Ii. Peri-migration (North Korean Border, China and 3rd Countries)	
Socio-Demographic Factors	1. Basic information of displacement
Traumatic Events in Forced Migration	1. HRV/Trauma variables during displacement (crossing China/North Korea border) 2. HRV/Trauma variables in China and 3rd countries
Iii. Post-migration (South Korea)	
Socio-Demographic Factors	1. Demographic profile in South Korea (resettlement) 2. SES variables
Resettlement stress	1. Discrimination, social exclusion and others
Physical, Mental Health and Psychosocial Status	1. General Health: Short-Form Health Survey 36 (6 items) 2. Mental Health: Hopkins SCL 25 Harvard Trauma Questionnaires
Resilience	1. Trust with generalized others 2. Social engagement 3. Self-control 4. Self-esteem

Table 2.3 Demographic characteristics of respondents

	Crude	RDS weighted	Homophily
	Freq (%) [95% CI]	Freq (%) [95% CI]	
Gender			
Female	265 (71.6)	67.5 [59.7-73.2]	0.208
Male	105 (28.4)	32.5 [26.8-40.3]	0.116
Age			
18-35yrs	101 (27.5)	29.8 [24.0-37.0]	0.134
35-59yrs.	197 (53.7)	51.3 [44.0-57.3]	0.148
60yrs or above	69 (18.8)	18.9 [13.8-24.4]	0.111
Education			
Primary school or lower	9 (2.5)	2.1 [0.8-4.1]	-1
Middle/High school	214 (58.2)	61.6 [54.9-66.8]	0.057
College (tech)	77 (20.9)	19.9 [15.1-24.6]	0.107
University or higher	68 (18.5)	16.4 [12.8-22.2]	0.083
Residence			
Rural	91 (25.9)	25.2 [19,31.5]	0.175
Urban	261 (74.2)	74.8 [68.5,81]	0.106
Marriage			
Married	62 (17)	14.3 [9.9,18.5]	0.075
Widowed	42 (11.5)	10.7 [7.2,14.9]	0.118
Divorced / Separated	90 (24.7)	27.2 [22,33.9]	0.121
Never	27 (7.4)	7.4 [4.4,10.8]	-0.153
Partner in North Korea	144 (39.5)	39.2 [33.1,44.9]	0.062
Reason of Displacement			
Political reason	108 (28.1)	26.7 [21.6,32.2]	0.091
Economic reason	150 (39.0)	39.2 [32.4,45.9]	0.21
Family invitation	83 (21.6)	26.5 [20.2,31.8]	0.184
Others	44 (11.4)	7.6 [5.2,11.5]	0.058

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3. Manuscript I: Social Distribution of Human Rights Violations

Abstract

Context: Despite concerns about the human rights in North Korea, few population-based assessments of the patterns and magnitude of human rights violations exist. Given the political inaccessibility, we assessed retrospective data from North Korean refugees and migrants recently displaced.

Methods: Between August 2014 and January 2015, we conducted a cross-sectional survey using respondent-driven sampling among 383 North Korean refugees and migrants resettling in South Korea during the last five years. The full range of human rights violations wase collected using a human rights violation inventory (HRVI-NK). Political, economic, and demographic profiles were obtained along with displacement status. Data analysis included bivariate and multivariate logistic regression analyses to assess associations between human rights violations and key variables of interest.

Result: Our findings indicate that 89.8% (CI: 86.1-93.5) of participants experienced political and civil rights violations, and 83.8% (CI: 78.5-88.2) experienced social and economic rights violations in North Korea. Almost all respondents witnessed those human rights violations in their communities. 63.8% (CI: 57.3-69.5) experienced a denial of the rights of freedom of thought, expression, and religion, and 49.1% (CI: 42.1-53.9) experienced structural discrimination. 74.6% (CI: 68.4-80) of respondents did not enjoy freedom of movement and residence, and 29.3% (CI: 24.7-35.2) suffered torture and inhuman treatment. More than half suffered from inadequate access to food (66.8%, CI: 60.1-73.1) and healthcare services (53.3%, CI: 46.7-60.2), and their livelihoods were

threatened by state actors (49.5%, CI: 41.9-56.1). 70.3% (CI: 64.3-75.9) reported forced labor. Lower household wealth and black market works were strongly associated with increased odds of a wider range of human rights violations, while lower political status (*Songbun*) was associated mainly with increased odds of political and civil rights violations.

Conclusion: The magnitude and prevalence of human rights violations were substantial and significantly associated with political and economic inequalities in North Korea. Efforts aimed at reducing human rights violations should be addressed for millions of survivors inside North Korea.

3.1 Introduction

North Korea is one of the world's most oppressive regimes.[1-3] North Koreans have been structurally discriminated based on *Songbun,* a state assigned political status based on family background.[4] The state has a monopoly over information from the outside and access to information from independent sources such as the internet, and foreign broadcasts are not officially permitted.[5] Furthermore, freedom of movement, thought, expression, and religion has been systematically restricted.[6, 7] North Korean institutions and officials have committed political violence such as torture, arbitrary arrest, detention, executions, and forced disappearance.[6, 7]

Despite its totalitarian political system, however, a chronic economic crisis under international sanction has led to substantial social changes in North Korea, particularly

through the expansion of the informal market mechanism. It is still unknown whether and how recent socioeconomic changes have resulted in the patterns of human rights violations in North Korea. Due to political inaccessibility to the North Korean population, population-based quantification of human rights violations and their association with political and socioeconomic factors was scarce.[8] There has been a lack of reliable statistics regarding who is vulnerable to human rights violations, and which risk factors have associated these violations.

To estimate the prevalence and social distribution of human rights violations, the Centers for Disease Control and Prevention (CDC) and the Korean Institute for National Unification (KINU) conducted a retrospective, cross-sectional survey between August 2014 and January 2015. We focused on the human rights violation experiences of North Korean refugees and migrants prior to displacement from North Korea. We hypothesized that North Koreans with different political and socioeconomic positions were differentially exposed to human rights violations.

3.2 Methods

We conducted qualitative interviews with 34 North Korean refugees and migrants to obtain context-specific information on human rights violations in North Korea. Based on this qualitative information, we developed the Human Rights Violation Inventory in North Korea (HRVI-NK) and evaluated it through focus group discussions with an expert panel of human rights activist, psychiatrist, political scientist and North Korean refugee worker. A total of 32 items covered individual and community exposures to gross and

systemic violations of human rights ranging from political and civil rights (referred to as negative rights) to social and economic rights (referred to as positive rights). Political and civil rights were measured with 19 total items covering five types human rights violations (Cronbach α=0.83) including torture and inhuman treatment (2 items, α=0.80); discrimination (3 items, α=0.47); freedom of movement and residence (4 items, α=0.59); freedom of thought, expression, and religion (6 items, α=0.71); and, arbitrary arrest, forced disappearance, and detention (4 items, α=0.56). Social and economic rights were measured with 13 items covering four types of human rights violations (α=0.87): right to food (5 items, α=0.82); the right to health (3 items, α=0.59); forced labor (3 items, α=0.63); right to livelihood (2 items, α=0.46). Respondents endorsed individual events according to four options including directly experienced (individual level), witnessed (community level), heard (community level) or not experienced. Each category of human rights violation was scored as 'exposed' if yes to any of the relevant items, or 'unexposed' if the answer was no for all items. Results based on the dichotomized variables are reported for both individual and community level violations.

To assess the effect of contextual factors on human rights violations, political status was measured by one's *Songbun* status and membership in the Worker's Party of Korea. Regarding socio-economic status, we collected information about household items (identified during formative data collection), and the wealth index was generated with quintile cut-offs based on a principal component analysis (PCA). We additionally collected information on respondent's household income level and experience of business in the formal and informal market.

Sampling design

The study inclusion criteria were North Koreans 18 years or older resettling in South Korea between 2009 and 2014, in order to reflect the recent situation in North Korea. The survey was conducted in Seoul, Incheon, and Kyoungi-do in South Korea between September 2014 and January 2015. Given the hard-to-reach nature of the North Korean refugees and migrants in urban communities, a respondent-driven sampling (RDS), peer-driven, chain referral sampling method was utilized. We selected ten initial participant seeds who had diverse social networks. Then we provided three coupons to each seed to recruit other eligible participants from their social networks. Each new participant who completed the interview was given three coupons for further recruitment until equilibrium of key variables such as sex was reached. We collected information ontheir social network size in refugee communities and tracked the referral pattern based upon coupon numbers. A total 383 individuals participated. The sex ratio in our sample was 28.15% men and 71.85% women, which is similar to the 28.2% men and 71.8% women in the entire North Korean population resettled in South Korea since 1999.[9]

Interview procedure

Ten North Korean interviewers trusted by local refugee communities were recruited, trained, and administered the structured questionnaire. Each interview was scheduled at a location chosen by the participant when new participants contacted the survey team. The study objectives, meaning, and potential risks of participation or non-participation were explained, and written consent was obtained prior to the interviews. Each interview took 60-90 minutes to complete, and we provided 20,000 won ($16) compensation per interview.

Statistical analysis

Prevalence estimates and confidence intervals (CIs) of human rights violations were calculated with RDSAT version 7.1., an RDS analysis software, and logistic regression was performed with STATA 13ME (StataCorp LP, USA). Crude and RDS-adjusted prevalence of human rights violations were separately reported at the individual and community levels. We also reported homophily (range: -1, 1), the tendency of people to recruit people similar to themselves, on key variables of interests. Bivariate logistic regression was conducted between the political and economic variables and each type of human rights violation. Multivariate logistic regression was undertaken with key variables of interest that were significantly associated in bivariate analyses (p-value < 0.05). Forward stepwise selection of variables of interests with demographic factors was also performed with the p-value set to 0.1. RDS-adjusted estimates were reported in bivariate and multivariate logistic regressions. Ten seeds were not included in the statistical analysis to reduce selection bias.

Ethical approval

The study protocol was approved by the Dankook University Institutional Review Board (IRB) in Seoul, Korea and, as secondary data analysis, by the Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland.

3.3 Results

Table 3.1 displays the characteristics of the final sample of 373 respondents, excluding the seeds. Overall, 31.5% of participants were members of the Workers' Party of Korea (WPK), 67.8% had a family member with WPK membership, and 61.6% had a household income under US$1 per day. 74.2% of participants came from urban areas in North Korea. Most North Korean participants had a middle school or higher level of education, and 2.5% were educated in primary school or lower. Regarding displacement status, 28.2 % were forced migrants who were displaced due to political persecution, punishment, or discrimination and 71.9% were voluntary migrants for economic reasons or family invitation, who did not report forced migration. Homophily did not exceed 0.217. Only negligible differences were found between crude and RDS-adjusted estimates.

Human rights violation experienced by North Korean refugees and migrants

In Table 3.2, the prevalence of nine major categories of 32 human rights violations reported by 373 respondents is reported. Most North Korean refugees and migrants experienced at least one political and civil rights violation (89.8%) in North Korea. 29.8% experienced either torture, intentional infliction of severe mental or physical pain or suffering by state authorities (21.7%), or other physical violence by police or security agents for more than 10 minutes (25.5%). 75.9% were denied freedom of movement and residence, including restriction of travel (65.4%) and residence (50.1%), banishment (20.1%) and forced separation from family members (32.7%). 64.6% of participants reported restrictions in freedom of thought, expression, and religion. Approximately a third of the sample experienced political persecution due to suspicion of loyalty (23.3%), political opinion (19.0%), and political misconduct of family (17.7%), or were the target

of an ideological criticism (*Sasangtoojeng,* 27.3%). More than half of the respondents experienced imprisonment without legal procedure (27.3%), the disappearance of a family member (19.0%), or the death of a family member in detention (23.6%). 44.5% had seen a public execution, and half of the respondents experienced either discrimination based on political status (35.4%), gender (23.6%), or stigma (17.2%).

Social and economic rights violations were also common in North Korea (85.8%). 64.9% met household hunger scale of FANTA-2 (Food and Nutrition Technical Assistance II Project) definitions[10] corresponding to life-threatening starvation of respondent (41.6%) and deaths of family members by starvation (20.6%). More than half experienced either severe sickness (36.7%) or deaths of family members (23.6%) without adequate access to healthcare. 32.2% experienced life-threatening illness due to severe cold. Also, their livelihood was systemically threatened (50.9%). 20.6% did not have a lawful means of livelihood for survival. 45.8% reported their means of livelihood were threatened by a state actor, for example by a crackdown on the black market. Forced labor was common (70.8%). Respondent involuntarily worked for Worker's Party of Korea or the army (46.9%) or was in detention (24.9%). 64.9% experienced involuntary work without compensation (64.9%).

At the community level, almost all (99.2%) respondents reported observing or hearing of at least one political or civil right violation (98.1%) or a social and economic rights violation (97.6%). The prevalence of each human right violation witnessed by respondent in the communities was exceptionally high.

Bivariate and multivariate analysis

In multivariate logistic regressions, there were statistically significant associations for each type of human rights violations with political and socioeconomic factors after adjustment for demographic factors such as age, gender, education, and place of residence in North Korea (Table 3.3). Lower *Songbun* (lowest political status vs highest quintile) was significantly associated with political and civil rights violations such as discrimination based on political status (Adj.OR=18.8, $p<0.001$) or gender (Adj.OR=6.1, $p<0.001$), political persecution due to political misconduct of family members (Adj.OR=7.2, $p<0.05$) and violations related to arbitrary arrest disappearance and detention (Adj.OR=5.9, $p<0.05$). In addition, lower household wealth (lowest vs. highest quintile) was statisticallyassociated with wide range of political and civil rights violations, including torture (Adj.OR=4.4, $p<0.001$) or other physical violence by police or security agent (Adj.OR=3.5, $p<0.05$), political discrimination (Adj.OR=4.4, $p<0.05$), family separation (Adj.OR=8.4, $p<0.001$), political persecution due to suspicion of loyalty (Adj.OR=5.9, $p<0.01$), misconduct of family (Adj.OR=6.3, $p<0.05$), or being target of ideological criticism (Adj.OR=5.3, $p<0.01$), imprisonment (Adj.OR=2.7, $p<0.05$), disappearance of family member (Adj.OR=8.2, $p<0.001$). The household wealth was also significantlly associated with more exposure to social and economic rights violations such as life-threatening starvation (Adj.OR=9.1, $p<0.001$) or forced labor (Adj.OR=3.4, $p<0.05$). Respondents who worked at *Jangmadang*, a black market, were more likely to report political and civil rights violations such as restriction of travel (Adj.OR=2.0, $p<0.05$) or residence (Adj.OR=2.7, $p<0.001$), political persecution due to political opinion (Adj.OR=4.4, $p<0.05$) or suspicion of loyalty (Adj.OR=4.4, $p<0.05$), being target

of ideological criticism (Adj.OR=3.4, $p<0.001$), as well as social and economic rights violations related to food (Adj.OR=2.7, $p<0.01$), livelihood (Adj.OR=2.7, $p<0.001$), forced labor (Adj.OR=2.1, $p<0.05$).

In bivariate logistic regression, a membership in the Worker's Party of Korea (WPK) was statistically associated with less exposure to discrimination based on political status (OR=0.5, $p<0.01$) or gender (OR=0.6, $p<0.05$), political persecution due to suspicion of loyalty (OR=0.4, $p<0.01$) or political misconduct of family (OR=0.4, $p<0.01$), life threatening starvation (OR=0.5, $p<0.01$), no access to lawful means of livelihood (OR=0.6, $p<0.05$), and forced labor (OR=0.6, $p<0.05$), except for freedom of travel (OR=2.15, $p<0.01$). Lower household income (daily income under USD$1) was significantly associated with higher exposure to social and economic rights violations such as household hunger (OR=2.5, $p<0.001$), life-threatening starvation (OR=2.8, $p<0.001$), death of family member without adequate health care service (OR=2.3, $p<0.05$), threats to means of livelihood by state actors (OR=2.2, $p<0.001$) or no access to lawful means of livelihood (OR=2.2, $p<0.05$).

Regarding demographic factors, compared to the younger group (18-35 years), the elderly (60 years or above) was more likely to experience stigma (OR=3.82, $p<0.01$), restriction of travel (OR=2.65, $p<0.05$), residence (Adj.OR=3.48, $p<0.01$) or banishment (Adj.OR=2.74, $p<0.05$), political persecution due to suspicion of loyalty (Adj.OR=5.92, $p<0.001$), threats to the means of livelihood (Adj.OR=2.48, $p<0.01$), and rights violations related to arbitrary arrest, forced disappearance, and detention (Adj.OR=2.46, $p<0.05$) and forced labor (Adj.OR=2.80, $p<0.05$). Being male was associated with increased

exposure to human rights violations related to torture and inhuman treatment (Adj.OR=1.83, $p<0.05$), , freedom of thought, expression, and religion (Adj.OR=2.91, $p<0.01$) and arbitrary arrest, forced disappearance, and detention (Adj.OR=1.99, $p<0.05$) and banishment (Adj.OR=2.93, $p<0.01$). Respondents from urban areas were less likely to expose to human rights violations such as restriction of travel (Adj.OR=0.4, $p<0.01$) and residence (Adj.OR=0.4, $p<0.01$), persecution due to political misconduct of family member (Adj.OR=0.3, $p<0.01$) or being target of ideological criticism (Adj.OR=0.46, $p<0.05$) and to rights violation related to food (Adj.OR=0.24, $p<0.01$) and livelihood (Adj.OR=0.53, $p<0.05$), except for exposure to physical violence by police or security agencies (Adj.OR=2.58, $p<0.05$).

3.4 Discussion

Our retrospective study confirms widespread, gross, and systematic human rights violations perpetrated by North Korean authorities. Most North Korean refugees and migrants reported experiencing human rights violations prior to displacement, and almost all witnessed those human rights violations in their communities. In spite of recent social transformation, the totalitarian nature of political system was still reflected in structural discrimination as well as in an almost complete denial of freedom of thought, expression, and religion, and freedom of movement. Findings suggest it was reinforced and safeguarded by a political and security apparatus that uses surveillance, torture, public executions, forced disappearance, and arbitrary arrest. Under a malfunctioning public distribution system, the North Korean population severely suffered from a lack of food and essential health services without lawful means of livelihood. The prevalence of each

human rights violation was exceptionally high, even compared to other authoritarian states.[1, 2] Results of this study are consistent with reports of specific abuses from the UN Commission of Inquiry and other human rights actors based on an abundance of qualitative research.[6, 7, 11, 12]

The study adds new findings indicating that human rights violations are disproportionally distributed by political, social, and economic inequalities[13, 14]. The post-socialist transition with the informal market economy has created a very unstable social system, perhaps outside of government control[15-18]. Wealth has emerged as new social capital between politically privileged and disadvantaged groups. In our study, human rights violations were statistically low among privileged groups who had the political and economic means to minimize their risk for abuses. Lower economic status was not only associated with household hunger or starvation under the informal market mechanism but also was related to increased likelihood of a wide range of political and civil rights violations. Lower political status was additionally significantly associated with political persecutions, structural discrimination or rights violations related to forced labor and livelihood. The study results imply that the pattern of breaches of human rights among individuals is significantly associated with changing inequalities and power imbalances in access to the political, social, and economic resources necessary to promote human rights or prevent human rights violations.

Given the political inaccessibility over the last 20 years, this study adopted an indirect sampling approach, based on refugee and migration populations for data collection. Under safe circumstances outside North Korea, North Korean refugees and migrants

provided numerous and detailed accounts of widespread human rights violations they experienced or witnessed prior to displacement. Although it was the most feasible alternative to investigating abuses in North Korea, however, caution should be taken in generalizing these results. Selection bias related to migration patterns may have led to underestimates of the frequency of abuses because our sample does not include the most vulnerable groups, such as political prisoners. For example, our sample undoubtedly underrepresented those who suffered severe disability or death related to human rights violence. Also, political and civil rights violations may have been overestimated in the refugee group displaced for political reasonsand underestimated in the migrant group who were voluntary migrated for economic reasons or family invitation. In addition, a 10-year recall period may create a bias, although we found respondents to have little difficulty answering questions in the human rights violation inventory, perhaps due to the intensity of traumatic event[19]. Lastly, while RDS was an alternative method for hidden or hard to reach population, it is not a population-based random sample.

3.5 Conclusion

The study results confirm the magnitude of human rights violations in North Korea that have been evaluated almost entirely in a qualitative manner to date. Findings newly indicate the social distribution of those violations across changing political and economic inequalities. The study finding can be used as epidemiologic evidence documenting the breadth of human rights concerns in North Korea, where the gravity, scale, and nature of these violations are unparalleled in the contemporary world. Efforts aimed at reducing human rights violations are imperative, and their consequences should be addressed for

millions of survivors inside North Korea.

Table 3.1 Political status, socioeconomic position, and demographic characteristics of Respondents

	Crude	Adjusted	Homophily
	Freq (%)	% [95% CI]	
Political Status: Songbun			
Very Good (Core class)	69 (18.7)	19.1 [14.8,24.5]	0.1
Good	88 (23.8)	23.1 [17.1,28.6]	0.128
Average (Basic class)	129 (34.9)	38.8 [33.1,46.8]	0.077
Bad	56 (15.1)	13.6 [9.6,16.8]	0.016
Very Bad (Hostile class)	28 (7.6)	5.4 [2.9,7]	0.061
Worker's Party of Korea Membership (Individual)			
Non-member	246 (68.52)	69 [62.2,74.9]	0.147
Member	113 (31.48)	31 [25.1,37.8]	0.145
Worker's Party of Korea Membership (Household)			
Non-member	117 (32.23)	32.7 [26.6,37.7]	0.031
Member	246 (67.77)	67.3 [62.3,73.4]	0.043
Household Income			
< USD1/day	197 (61.6)	64 [57.3,70.9]	0.038
> USD1/day	123 (38.4)	36 [29.1,42.7]	0.073
Market Activity			
Non-engaged	132 (37.93)	37.9 [31.7,45.5]	0.179
Engaged	216 (62.07)	62.1 [54.5,68.3]	0.166
Remittance			
Not Received	127 (37.3)	39 [31.1,44.8]	0.164
Received	216 (63.0)	61 [55.2,68.9]	0.175
Gender			
Female	268 (71.9)	67.4 [61.1,73.2]	0.217
Male	105 (28.2)	32.6 [26.8,38.9]	0.11
Age			
18-35yrs	101 (27.5)	29.8 [24.0,37.0]	0.134
35-59yrs	197 (53.7)	51.3 [44.0,57.3]	0.148
60yrs or Above	69 (18.8)	18.9 [13.8,24.4]	0.111
Education			
Primary School or Lower	9 (2.5)	2.1 [0.8,4.1]	-1
Middle/High School	214 (58.2)	61.6 [54.9,66.8]	0.057
College (Tech)	77 (20.9)	19.9 [15.1,24.6]	0.107
University or Higher	68 (18.5)	16.4 [12.8,22.2]	0.083
Residence			
Rural	91 (25.9)	25.2 [19,31.5]	0.175
Urban	261 (74.2)	74.8 [68.5,81]	0.106
Marriage			
Married	62 (17)	14.3 [9.9,18.5]	0.075
Widowed	42 (11.5)	10.7 [7.2,14.9]	0.118
Divorced / Separated	90 (24.7)	27.2 [22,33.9]	0.121
Never	27 (7.4)	7.4 [4.4,10.8]	-0.153
Partner in North Korea	144 (39.5)	39.2 [33.1,44.9]	0.062
Displacement status			
Forced Migration	105(28.2)	26.2 [21.3,31.5]	0.022
Voluntary Migration	268 (71.9)	73.8 [68.5,78.7]	0.096

*Forced migration includes those who were displaced due to political persecution, punishment, or discrimination; voluntary migration includes those who migrated for economic reasons or family invitation, without citing a reason of forced migration.

Table 3.2 Human rights violations in North Korea

	Individual		Community	
	Crude	Adjusted	Crude	Adjusted
Political and civil rights	**Freq (%) [95% CI]**	**% [95% CI]**	**Freq (%) [95% CI]**	**% [95% CI]**
Torture and inhuman treatment	111 (29.8) [25.1,34.4]	29.3 [24.7,35.2]	247 (66.2) [61.4-71]	67.5 [60.7,74.1]
Tortured	81 (21.7) [17.5,25.9]	21.4 [17.3,26.4]	219 (58.7) [53.7-63.7]	60.7 [54.2,66.4]
Physical violence by police/security agency (>10 mins)	95 (25.5) [21,29.9]	25.6 [20.9,31.4]	226 (60.6) [55.6-65.6]	62.6 [55.9,69.6]
Discrimination	186 (49.9) [44.8,55]	49.1 [42.1,53.9]	322 (86.3) [82.8-89.8]	87.6 [83.2,90.8]
Political status based	132 (35.4) [30.5,40.3]	33.3 [27.1,37.9]	286 (76.7) [72.4-81]	78.3 [72.5,83.1]
Gender based	88 (23.6) [19.3,27.9]	23.6 [17.8,29]	263 (70.5) [65.9-75.2]	72.1 [66.4,77.1]
Stigma, unspecified	64 (17.2) [13.3,21]	17.6 [12.6,21.7]	213 (57.1) [52.1-62.2]	60.4 [53.1,66.4]
Freedom of movement and residence	283 (75.9) [71.5,80.2]	74.6 [68.4,80]	344 (92.2) [89.5-95]	93.1 [89.6,96]
Travel	244 (65.4) [60.6,70.3]	66.5 [60,71.8]	312 (83.6) [79.9-87.4]	85.5 [80.4,89.5]
Residence	187 (50.1) [45,55.2]	50.3 [44.1,57]	299 (80.2) [76.1-84.2]	82.2 [77.6,86.6]
Banishment	75 (20.1) [16,24.2]	20.3 [15.8,25]	259 (69.4) [64.7-74.1]	71.4 [65.7,76.5]
Family separation	122 (32.7) [27.9,37.5]	31.7 [25.6,37.5]	252 (67.6) [62.8-72.3]	68.7 [62.3,74.3]
Freedom of thought, expression and religion	241 (64.6) [59.7,69.5]	63.8 [57.3,69.5]	325 (87.1) [83.7-90.5]	87.2 [82.9,91.5]
Surveillance	172 (46.1) [41,51.2]	46.0 [39.7,52.5]	269 (72.1) [67.5-76.7]	74.0 [68,79.1]
Religious persecution	10 (2.7) [1,4.3]	3.0 [1.2,5.1]	112 (30.0) [25.4-34.7]	33.4 [27.2,39.8]
Persecution (political opinion)	71 (19.0) [15,23]	16.7 [12.6,21.3]	232 (62.2) [57.3-67.1]	64.4 [57.8,70.9]
Persecution (suspicion of loyalty)	87 (23.3) [19,27.6]	21.5 [17.3,26]	229 (61.4) [56.4-66.4]	63.6 [56.9,69.9]
Persecution (political misconduct of family)	66 (17.7) [13.8,21.6]	16.4 [12.5,20.5]	209 (56.0) [51-61.1]	59.0 [51.4,65.4]
Being target of ideological criticism (*Sasang toojeng)*	102 (27.3) [22.8,31.9]	27.4 [22.7,32.5]	239 (64.1) [59.2-69]	66.1 [59.8,72.5]
Arbitrary arrest, disappearance, and detention	231 (61.9) [57,66.9]	60.5 [53.7,66.7]	352 (94.4) [92-96.7]	92.8 [88.9,96.1]
Imprisonment without legal procedure	102 (27.3) [22.8,31.9]	27.0 [21.7,32.4]	226 (60.6) [55.6-65.6]	61.4 [54.8,67.7]
Disappearance of family member	71 (19.0) [15,23]	19.7 [14.6,25.2]	187 (50.1) [45-55.2]	52.9 [45.9,58.5]
Death of family member in detention	88 (23.6) [19.3,27.9]	23.0 [17.3,29.4]	253 (67.8) [63.1-72.6]	70.0 [63.1,76]
Public execution (eyewitness)	166 (44.5) [39.4,49.6]	43.7 [37,49.4]	326 (87.4) [84-90.8]	87.3 [83.5,91.4]
Social, economic &cultural rights				
Right to food	260 (69.7) [65,74.4]	66.8 [60.1,73.1]	338 (90.6) [87.6-93.6]	90.6 [85.5,94.5]
Household Hunger Scale (FANTA 2, 3 items)	242 (64.9) [60.0,69.7]	60.7 [54.6,67.2]	321 (86.0) [82.5-89.6]	86.4 [82,90.6]
Life threatening starvation (respondent)	155 (41.6) [36.5,46.6]	40.4 [33.5,46.9]	281 (75.3) [70.9-79.7]	71.8 [64.4,77.9]
Life threatening starvation (family member)	77 (20.6) [16.5,24.8]	18.5 [13.4,24.2]	282 (75.6) [71.2-80]	76.0 [70.7,81.3]
Right to health	203 (54.4) [49.3,59.5]	53.3 [46.7,60.2]	319 (85.5) [81.9-89.1]	84.4 [78.8,89.4]
Severe sickness of family without healthcare	137 (36.7) [31.8,41.6]	34.1 [28.1,40.1]	278 (74.5) [70.1-79]	71.9 [65.6,78]
Death of family member without healthcare	88 (23.6) [19.3,27.9]	22.7 [17.4,28.6]	281 (75.3) [70.9-79.7]	75.7 [69.4,81.3]
Life threatening due to severe cold	120 (32.2) [27.4,36.9]	33.0 [26,39.8]	247 (66.2) [61.4-71]	68.3 [61.7,74.1]
Right to livelihood	190 (50.9) [45.8,56]	49.5 [41.9,56.1]	296 (79.4) [75.2-83.5]	80.1 [73.5,85.2]
Means of livelihood threatened by state actor	171 (45.8) [40.8,50.9]	45.4 [37.5,52]	288 (77.2) [72.9-81.5]	79.3 [72.6,84.4]
No access to lawful means of livelihood	77 (20.6) [16.5,24.8]	20.5 [15.4,26.2]	212 (56.8) [51.8-61.9]	60.0 [52.9,67.4]
Forced labor	264 (70.8) [66.1,75.4]	70.3 [64.3,75.9]	336 (90.1) [87-93.1]	89.0 [83.9,93]
Involuntary works for WPK or army	175 (46.9) [41.8,52]	47.9 [41.9,53.9]	273 (73.2) [68.7-77.7]	74.5 [69.2,80.2]
Involuntary works in detention	93 (24.9) [20.5,29.3]	24.8 [19.6,30.4]	237 (63.5) [58.6-68.4]	63.3 [56.3,69.6]
Involuntary works without compensation	242 (64.9) [60,69.7]	64.6 [57.2,70.2]	319 (85.5) [81.9-89.1]	84.5 [78.2,89.4]

Table 3.3 Bivariate and multivariate logistic regression: human rights violations associated with political and economic position (*p<.05;**p<.01;***p<.001)

	Bivariate			Multivariate		
	Songbun	Wealth	Market	Songbun	Wealth	Market
Political and civil rights	OR [95%CI]	OR [95%CI]	OR [95%CI]	OR [95%CI]	OR [95%CI]	OR [95%CI]
Torture and inhuman treatment	1.78 [0.61,5.16]	2.14* [1.09,4.21]	1 [0.62,1.61]	1.26 [0.33,4.79]	3.23* [1.21,8.62]	1.02 [0.56,1.88]
Tortured	2.11 [0.62,7.20]	3.49** [1.53,7.97]	1.14 [0.67,1.93]	0.94 [0.21,4.17]	4.40** [1.49,12.99]	1.17 [0.60,2.30]
Physical violence by police/security agency	1.33 [0.43,4.11]	1.81 [0.91,3.58]	0.93 [0.57,1.52]	0.66 [0.15,2.89]	3.54* [1.31,9.60]	1.04 [0.55,1.96]
Discrimination	13.63*** [3.49,53.21]	1.98* [1.04,3.76]	1.06 [0.68,1.63]	26.26*** [3.82,180.33]	1.86 [0.72,4.85]	1.3 [0.73,2.29]
Political status based	11.59*** [3.79,35.50]	2.67** [1.32,5.44]	0.97 [0.61,1.54]	18.79*** [4.29,82.21]	4.37* [1.42,13.46]	1.3 [0.68,2.49]
Gender based	3.09* [1.13,8.45]	1.19 [0.54,2.60]	1.29 [0.77,2.15]	6.12** [1.67,22.44]	0.61 [0.19,1.89]	0.99 [0.52,1.88]
Stigma, unspecified	5.42** [1.58,18.65]	2.03 [0.88,4.64]	1.14 [0.63,2.08]	4.26 [0.87,20.91]	1.17 [0.36,3.79]	1.17 [0.56,2.46
Freedom of movement and residence	1.67 [0.46,6.10]	1.71 [0.84,3.46]	1.66* [1.02,2.69]	2.4 [0.44,13.01]	1.94 [0.69,5.44]	1.43 [0.76,2.68]
Travel	1.31 [0.46,3.74]	1.11 [0.57,2.16]	1.95** [1.24,3.06]	2.41 [0.62,9.40]	1.09 [0.42,2.86]	1.95* [1.09,3.49]
Residence	0.77 [0.30,2.02]	1.25 [0.66,2.36]	2.18*** [1.39,3.40]	0.82 [0.24,2.75]	0.74 [0.29,1.87]	2.65*** [1.51,4.65]
Banishment	2.76 [0.97,7.90]	3.87** [1.50,10.02]	1.22 [0.70,2.14]	1.61 [0.39,6.56]	2.44 [0.64,9.40]	0.95 [0.46,1.96]
Family separation	1.39 [0.48,3.97]	4.83*** [2.24,10.42]	0.94 [0.58,1.51]	0.53 [0.14,2.05]	8.44*** [2.98,23.90]	1 [0.55,1.83]
Freedom of thought, expression and religion	3.75* [1.05,13.45]	2.66** [1.32,5.38]	1.5 [0.95,2.35]	3.97 [0.71,22.07]	4.96** [1.67,14.75]	2.08* [1.14,3.78]
Surveillance	2.92* [1.05,8.10]	1.72 [0.91,3.27]	0.97 [0.63,1.50]	2.2 [0.64,7.51]	1.53 [0.63,3.73]	1.25 [0.73,2.14]
Religious persecution	0.88 [0.06,13.81]	1 [1.00,1.00]	1.04 [0.28,3.79]	1 [1.00,1.00]	1 [1.00,1.00]	1.22 [0.20,7.36]
Persecution (political opinion)	4.99** [1.69,14.74]	2.59* [1.09,6.16]	1.58 [0.87,2.89]	3.92 [0.95,16.23]	2.24 [0.63,7.98]	2.54* [1.10,5.85]
Persecution (suspicion of loyalty)	3.77* [1.33,10.69]	5.72*** [2.40,13.60]	1.79* [1.03,3.13]	2.53 [0.60,10.59]	5.94*** [1.75,20.19]	2.48* [1.14,5.37]
Persecution (political misconduct of family)	9.30*** [2.85,30.35]	6.50*** [2.33,18.12]	0.92 [0.51,1.68]	7.19* [1.50,34.52]	6.25* [1.52,25.66]	1.07 [0.47,2.46]
Being target of ideological criticism	2.51 [0.87,7.26]	4.28*** [1.81,10.14]	2.35** [1.37,4.03]	1.38 [0.35,5.42]	5.30** [1.69,16.61]	3.35*** [1.66,6.75]
Arbitrary arrest, disappearance, and detention	4.11* [1.23,13.73]	2.43** [1.26,4.69]	1.52 [0.98,2.37]	5.85* [1.19,28.61]	3.45* [1.28,9.27]	1.91* [1.07,3.43]
Imprisonment without legal procedure	1.73 [0.58,5.14]	2.43* [1.19,4.97]	1.08 [0.66,1.77]	1.07 [0.28,4.15]	2.69* [1.01,7.21]	1.08 [0.59,1.98]
Disappearance of family member	3.21 [0.98,10.49]	5.32*** [2.16,13.06]	0.93 [0.53,1.62]	4.57 [0.99,21.22]	8.22*** [2.40,28.14]	0.69 [0.34,1.41]
Death of family member in detention	2.49 [0.88,7.06]	2.89* [1.23,6.77]	1.18 [0.71,1.96]	2.9 [0.79,10.58]	5.02** [1.65,15.34]	0.99 [0.52,1.88]
Public execution (eyewitness)	1.43 [0.55,3.74]	1.13 [0.59,2.15]	1.81* [1.15,2.86]	1.4 [0.40,4.89]	1.05 [0.40,2.73]	3.08*** [1.69,5.62]
Social and economic rights						
Right to food	3.83* [1.21,12.13]	9.59*** [4.42,20.80]	2.59*** [1.63,4.13]	2.47 [0.48,12.82]	8.17*** [2.58,25.91]	2.68** [1.41,5.07]
Household Hunger Scale	1.94 [0.48,7.79]	3.49** [1.45,8.40]	2.10* [1.16,3.81]	2.25 [0.22,22.83]	2.34 [0.61,8.99]	2.01 [0.95,4.28]
Life threatening starvation (respondent)	1.44 [0.55,3.81]	8.53*** [3.79,19.20]	2.40*** [1.51,3.81]	0.78 [0.22,2.73]	9.05*** [3.18,25.70]	1.75 [0.97,3.19]
Life threatening starvation (family member)	1.3 [0.39,4.33]	4.28** [1.63,11.26]	1.25 [0.72,2.18]	0.86 [0.20,3.69]	7.63** [2.23,26.11]	1.25 [0.63,2.49]
Right to health	0.65 [0.25,1.72]	1.94* [1.02,3.70]	1.70* [1.10,2.63]	0.29* [0.09,0.99]	1.88 [0.77,4.57]	1.69 [0.99,2.90]
Severe sickness of family without healthcare	0.86 [0.31,2.39]	1.71 [0.87,3.38]	1.25 [0.78,1.99]	0.43 [0.12,1.58]	2.34 [0.90,6.07]	1.38 [0.78,2.47]
Death of family member without healthcare	0.72 [0.21,2.53]	4.74** [1.70,13.20]	1.88* [1.07,3.29]	0.27 [0.05,1.32]	3.52 [0.99,12.55]	2.27* [1.14,4.53]
Life threatening due to severe cold	1.02 [0.35,2.93]	2.74** [1.32,5.70]	2.31*** [1.42,3.76]	0.84 [0.24,3.03]	1.95 [0.74,5.13]	1.93* [1.08,3.47]
Right to Livelihood	2.05 [0.77,5.50]	3.78*** [1.92,7.43]	2.90*** [1.84,4.56]	1.57 [0.44,5.55]	1.56 [0.60,4.02]	2.69*** [1.53,4.73]
Means of livelihood threatened by state actor	1.79 [0.68,4.69]	3.14** [1.58,6.25]	3.22*** [2.02,5.13]	1.41 [0.41,4.90]	1.31 [0.49,3.49]	3.07*** [1.71,5.50]
No access to lawful means of livelihood	3.20* [1.03,9.92]	3.89** [1.52,9.99]	0.99 [0.57,1.72]	2.26 [0.57,9.02]	2.32 [0.66,8.17]	0.79 [0.40,1.57]
Forced Labor	2.77 [0.76,10.07]	2.71** [1.34,5.46]	1.93** [1.20,3.10]	5.83 [0.88,38.57]	3.39* [1.18,9.76]	2.12* [1.16,3.86]
Involuntary works for WPK or army	2.02 [0.77,5.32]	1.55 [0.82,2.95]	1.17 [0.76,1.81]	2.36 [0.71,7.81]	1 [0.41,2.43]	1.34 [0.78,2.31]
Involuntary works in detention	3.51* [1.17,10.52]	3.19** [1.50,6.80]	1.29 [0.77,2.14]	2.32 [0.60,8.95]	3.97** [1.44,10.94]	1.44 [0.77,2.72]
Involuntary works without compensation	1.79 [0.60,5.36]	2.84** [1.45,5.59]	1.66* [1.06,2.61]	2.56 [0.60,10.91]	3.17* [1.18,8.54]	1.67 [0.95,2.95]

Table 3.4 Bivariate logistic regression: human rights violations associated with additional political and economic position

	Songbun	WPK member	Wealth	Poverty	Market
Political and civil rights	OR [95%CI]	OR [95%CI]	OR [95%CI]	OR [95%CI]	OR [95%CI]
Torture and inhuman treatment	1.78 [0.61,5.16]	1.19 [0.73,1.95]	2.14* [1.09,4.21]	0.95 [0.58,1.54]	1 [0.62,1.61]
Tortured	2.11 [0.62,7.20]	0.88 [0.52,1.51]	3.49** [1.53,7.97]	1.31 [0.75,2.28]	1.14 [0.67,1.93]
Physical violence by police/security agency	1.33 [0.43,4.11]	0.98 [0.60,1.62]	1.81 [0.91,3.58]	0.79 [0.48,1.29]	0.93 [0.57,1.52]
Discrimination	13.63*** [3.49,53.21]	0.50** [0.32,0.78]	1.98* [1.04,3.76]	0.82 [0.52,1.28]	1.06 [0.68,1.63]
Political status based	11.59*** [3.79,35.50]	0.47** [0.30,0.75]	2.67** [1.32,5.44]	0.91 [0.56,1.46]	0.97 [0.61,1.54]
Gender based	3.09* [1.13,8.45]	0.60* [0.37,1.00]	1.19 [0.54,2.60]	1.37 [0.80,2.35]	1.29 [0.77,2.15]
Stigma, unspecified	5.42** [1.58,18.65]	0.78 [0.43,1.41]	2.03 [0.88,4.64]	0.97 [0.54,1.77]	1.14 [0.63,2.08]
Freedom of movement and residence	1.67 [0.46,6.10]	1.59 [0.97,2.60]	1.71 [0.84,3.46]	0.79 [0.47,1.32]	1.66* [1.02,2.69]
Travel	1.31 [0.46,3.74]	2.15** [1.36,3.41]	1.11 [0.57,2.16]	0.75 [0.46,1.20]	1.95** [1.24,3.06]
Residence	0.77 [0.30,2.02]	1.5 [0.96,2.36]	1.25 [0.66,2.36]	1.15 [0.73,1.80]	2.18*** [1.39,3.40]
Banishment	2.76 [0.97,7.90]	0.68 [0.39,1.17]	3.87** [1.50,10.02]	1.86 [1.00,3.48]	1.22 [0.70,2.14]
Family separation	1.39 [0.48,3.97]	0.71 [0.44,1.15]	4.83*** [2.24,10.42]	1.19 [0.73,1.96]	0.94 [0.58,1.51]
Freedom of thought, expression and religion	3.75* [1.05,13.45]	0.8 [0.50,1.29]	2.66** [1.32,5.38]	1.2 [0.75,1.91]	1.5 [0.95,2.35]
Surveillance	2.92* [1.05,8.10]	0.83 [0.53,1.30]	1.72 [0.91,3.27]	0.97 [0.62,1.52]	0.97 [0.63,1.50]
Religious persecution	0.88 [0.06,13.81]	0.47 [0.13,1.73]	1 [1.00,1.00]	5.59 [0.54,57.63]	1.04 [0.28,3.79]
Persecution (political opinion)	4.99** [1.69,14.74]	0.65 [0.37,1.15]	2.59* [1.09,6.16]	1.46 [0.78,2.75]	1.58 [0.87,2.89]
Persecution (suspicion of loyalty)	3.77* [1.33,10.69]	0.44** [0.26,0.74]	5.72*** [2.40,13.60]	1.81* [1.01,3.24]	1.79* [1.03,3.13]
Persecution (political misconduct of family)	9.30*** [2.85,30.35]	0.44** [0.24,0.79]	6.50*** [2.33,18.12]	1.48 [0.76,2.89]	0.92 [0.51,1.68]
Being target of ideological criticism	2.51 [0.87,7.26]	0.69 [0.42,1.13]	4.28*** [1.81,10.14]	1.38 [0.81,2.35]	2.35** [1.37,4.03]
Arbitrary arrest, disappearance, and detention	4.11* [1.23,13.73]	0.82 [0.52,1.30]	2.43** [1.26,4.69]	0.99 [0.62,1.56]	1.52 [0.98,2.37]
Imprisonment without legal procedure	1.73 [0.58,5.14]	0.72 [0.44,1.17]	2.43* [1.19,4.97]	1.16 [0.69,1.93]	1.08 [0.66,1.77]
Disappearance of family member	3.21 [0.98,10.49]	0.64 [0.37,1.10]	5.32*** [2.16,13.06]	1.1 [0.62,1.95]	0.93 [0.53,1.62]
Death of family member in detention	2.49 [0.88,7.06]	1.53 [0.88,2.64]	2.89* [1.23,6.77]	1.23 [0.72,2.09]	1.18 [0.71,1.96]
Public execution (eyewitness)	1.43 [0.55,3.74]	0.98 [0.62,1.54]	1.13 [0.59,2.15]	0.74 [0.47,1.17]	1.81* [1.15,2.86]
Social and economic rights					
Right to food & related the right to life	3.83* [1.21,12.13]	0.58* [0.35,0.96]	9.59*** [4.42,20.80]	2.87*** [1.79,4.62]	2.59*** [1.63,4.13]
Household Hunger Scale (FANTA 2, 3 items)	1.94 [0.48,7.79]	0.71 [0.37,1.36]	3.49** [1.45,8.40]	2.47** [1.35,4.51]	2.10* [1.16,3.81]
Life threatening starvation (respondent)	1.44 [0.55,3.81]	0.54** [0.34,0.84]	8.53*** [3.79,19.20]	2.83*** [1.72,4.66]	2.40*** [1.51,3.81]
Life threatening starvation (family member)	1.3 [0.39,4.33]	0.85 [0.49,1.48]	4.28** [1.63,11.26]	1.11 [0.63,1.97]	1.25 [0.72,2.18]
Right to health	0.65 [0.25,1.72]	0.92 [0.59,1.43]	1.94* [1.02,3.70]	1.44 [0.92,2.25]	1.70* [1.10,2.63]
Severe sickness of family without healthcare	0.86 [0.31,2.39]	0.91 [0.57,1.46]	1.71 [0.87,3.38]	1.05 [0.66,1.66]	1.25 [0.78,1.99]
Death of family member without healthcare	0.72 [0.21,2.53]	0.67 [0.39,1.13]	4.74** [1.70,13.20]	2.29** [1.24,4.23]	1.88* [1.07,3.29]
Life threatening due to severe cold	1.02 [0.35,2.93]	0.95 [0.60,1.52]	2.74** [1.32,5.70]	2.29** [1.37,3.83]	2.31*** [1.42,3.76]
Right to livelihood	2.05 [0.77,5.50]	0.98 [0.63,1.53]	3.78*** [1.92,7.43]	2.42*** [1.52,3.85]	2.90*** [1.84,4.56]
Means of livelihood threatened by state actor	1.79 [0.68,4.69]	1.18 [0.76,1.85]	3.14** [1.58,6.25]	2.21*** [1.38,3.53]	3.22*** [2.02,5.13]
No access to lawful means of livelihood	3.20* [1.03,9.92]	0.56* [0.33,0.97]	3.89** [1.52,9.99]	2.23* [1.17,4.25]	0.99 [0.57,1.72]
Forced labor	2.77 [0.76,10.07]	1.16 [0.71,1.88]	2.71** [1.34,5.46]	1.15 [0.70,1.87]	1.93** [1.20,3.10]
Involuntary works for WPK or army	2.02 [0.77,5.32]	0.62* [0.40,0.97]	1.55 [0.82,2.95]	1.12 [0.71,1.75]	1.17 [0.76,1.81]
Involuntary works in detention	3.51* [1.17,10.52]	0.65 [0.40,1.07]	3.19** [1.50,6.80]	1.24 [0.73,2.10]	1.29 [0.77,2.14]
Involuntary works without compensation	1.79 [0.60,5.36]	1.32 [0.83,2.09]	2.84** [1.45,5.59]	1.27 [0.80,2.02]	1.66* [1.06,2.61]

*p<0.05; **p<0.01; ***p<0.001; WPK (Worker's Party of Korea)

Table 3.5 Multivariate logistic regression: human rights violations associated with additional political and economic position

	Songbun	WPK member	Wealth	Poverty	Market
Political and civil rights	OR [95%CI]	OR [95%CI]	OR [95%CI]	OR [95%CI]	OR [95%CI]
Torture and inhuman treatment	1.26 [0.33,4.79]	1.55 [0.83,2.90]	3.23* [1.21,8.62]	0.83 [0.41,1.69]	1.02 [0.56,1.88]
Tortured	0.94 [0.21,4.17]	0.93 [0.48,1.81]	4.40** [1.49,12.99]	0.8 [0.37,1.73]	1.17 [0.60,2.30]
Physical violence by police/security agency	0.66 [0.15,2.89]	1.08 [0.57,2.05]	3.54* [1.31,9.60]	0.65 [0.31,1.35]	1.04 [0.55,1.96]
Discrimination	26.26*** [3.82,180.33]	0.68 [0.38,1.23]	1.86 [0.72,4.85]	0.43* [0.21,0.86]	1.3 [0.73,2.29]
Political status based	18.79*** [4.29,82.21]	0.68 [0.35,1.30]	4.37* [1.42,13.46]	0.28** [0.13,0.61]	1.3 [0.68,2.49]
Gender based	6.12** [1.67,22.44]	0.72 [0.38,1.36]	0.61 [0.19,1.89]	1.8 [0.82,3.92]	0.99 [0.52,1.88]
Stigma, unspecified	4.26 [0.87,20.91]	1 [0.48,2.08]	1.17 [0.36,3.79]	0.94 [0.39,2.24]	1.17 [0.56,2.46
Freedom of movement and residence	2.4 [0.44,13.01]	1.41 [0.74,2.71]	1.94 [0.69,5.44]	0.44* [0.20,0.97]	1.43 [0.76,2.68]
Travel	2.41 [0.62,9.40]	1.92* [1.06,3.50]	1.09 [0.42,2.86]	0.58 [0.29,1.17]	1.95* [1.09,3.49]
Residence	0.82 [0.24,2.75]	1.3 [0.73,2.31]	0.74 [0.29,1.87]	0.94 [0.50,1.80]	2.65*** [1.51,4.65]
Banishment	1.61 [0.39,6.56]	0.78 [0.38,1.63]	2.44 [0.64,9.40]	2.07 [0.82,5.26]	0.95 [0.46,1.96]
Family separation	0.53 [0.14,2.05]	0.86 [0.47,1.58]	8.44*** [2.98,23.90]	0.52 [0.26,1.06]	1 [0.55,1.83]
Freedom of thought, expression and religion	3.97 [0.71,22.07]	0.76 [0.40,1.45]	4.96** [1.67,14.75]	0.68 [0.34,1.37]	2.08* [1.14,3.78]
Surveillance	2.2 [0.64,7.51]	0.94 [0.54,1.66]	1.53 [0.63,3.73]	0.97 [0.52,1.84]	1.25 [0.73,2.14]
Religious persecution	1 [1.00,1.00]	0.61 [0.10,3.66]	1 [1.00,1.00]	1.95 [0.13,29.19]	1.22 [0.20,7.36]
Persecution (political opinion)	3.92 [0.95,16.23]	0.94 [0.43,2.05]	2.24 [0.63,7.98]	0.86 [0.34,2.16]	2.54* [1.10,5.85]
Persecution (suspicion of loyalty)	2.53 [0.60,10.59]	0.53 [0.26,1.09]	5.94** [1.75,20.19]	0.8 [0.34,1.92]	2.48* [1.14,5.37]
Persecution (political misconduct of family)	7.19* [1.50,34.52]	0.67 [0.30,1.50]	6.25* [1.52,25.66]	0.56 [0.21,1.53]	1.07 [0.47,2.46]
Being target of ideological criticism	1.38 [0.35,5.42]	0.77 [0.40,1.46]	5.30** [1.69,16.61]	0.5 [0.24,1.04]	3.35*** [1.66,6.75]
Arbitrary arrest, disappearance, and detention	5.85* [1.19,28.61]	0.79 [0.43,1.47]	3.45* [1.28,9.27]	0.42* [0.21,0.86]	1.91* [1.07,3.43]
Imprisonment without legal procedure	1.07 [0.28,4.15]	0.9 [0.49,1.68]	2.69* [1.01,7.21]	0.92 [0.45,1.88]	1.08 [0.59,1.98]
Disappearance of family member	4.57 [0.99,21.22]	0.77 [0.39,1.54]	8.22*** [2.40,28.14]	0.47 [0.20,1.08]	0.69 [0.34,1.41]
Death of family member in detention	2.9 [0.79,10.58]	2.58** [1.29,5.13]	5.02** [1.65,15.34]	0.84 [0.41,1.73]	0.99 [0.52,1.88]
Public execution (eyewitness)	1.4 [0.40,4.89]	0.68 [0.38,1.24]	1.05 [0.40,2.73]	0.39** [0.20,0.75]	3.08*** [1.69,5.62]
Social and economic rights					
Right to food	2.47 [0.48,12.82]	0.47* [0.23,0.97]	8.17*** [2.58,25.91]	1.08 [0.53,2.21]	2.68** [1.41,5.07]
Household Hunger Scale (FANTA 2, 3 items)	2.25 [0.22,22.83]	0.55 [0.22,1.36]	2.34 [0.61,8.99]	1.65 [0.67,4.09]	2.01 [0.95,4.28]
Life threatening starvation (respondent)	0.78 [0.22,2.73]	0.47* [0.26,0.86]	9.05*** [3.18,25.70]	0.96 [0.49,1.90]	1.75 [0.97,3.19]
Life threatening starvation (family member)	0.86 [0.20,3.69]	0.93 [0.47,1.87]	7.63** [2.23,26.11]	0.55 [0.26,1.20]	1.25 [0.63,2.49]
Right to health	0.29* [0.09,0.99]	0.76 [0.43,1.34]	1.88 [0.77,4.57]	0.94 [0.50,1.77]	1.69 [0.99,2.90]
Severe sickness of family without healthcare	0.43 [0.12,1.58]	0.7 [0.39,1.28]	2.34 [0.90,6.07]	0.62 [0.32,1.21]	1.38 [0.78,2.47]
Death of family member without healthcare	0.27 [0.05,1.32]	0.72 [0.37,1.39]	3.52 [0.99,12.55]	1.13 [0.51,2.54]	2.27* [1.14,4.53]
Life threatening due to severe cold	0.84 [0.24,3.03]	1.06 [0.59,1.90]	1.95 [0.74,5.13]	1.41 [0.71,2.78]	1.93* [1.08,3.47]
Right to Livelihood	1.57 [0.44,5.55]	0.9 [0.50,1.62]	1.56 [0.60,4.02]	1.58 [0.82,3.03]	2.69*** [1.53,4.73]
Means of livelihood threatened by state actor	1.41 [0.41,4.90]	1.21 [0.67,2.19]	1.31 [0.49,3.49]	1.54 [0.79,3.03]	3.07*** [1.71,5.50]
No access to lawful means of livelihood	2.26 [0.57,9.02]	0.64 [0.33,1.26]	2.32 [0.66,8.17]	1.92 [0.80,4.63]	0.79 [0.40,1.57]
Forced Labor	5.83 [0.88,38.57]	1.07 [0.56,2.05]	3.39* [1.18,9.76]	0.54 [0.25,1.16]	2.12* [1.16,3.86]
Involuntary works for WPK or army	2.36 [0.71,7.81]	0.54* [0.30,0.95]	1 [0.41,2.43]	0.77 [0.41,1.45]	1.34 [0.78,2.31]
Involuntary works in detention	2.32 [0.60,8.95]	0.66 [0.35,1.22]	3.97** [1.44,10.94]	0.65 [0.32,1.34]	1.44 [0.77,2.72]
Involuntary works without compensation	2.56 [0.60,10.91]	1.33 [0.72,2.44]	3.17* [1.18,8.54]	0.82 [0.41,1.62]	1.67 [0.95,2.95]

*p<0.05; **p<0.01; ***p<0.001; WPK (Worker's Party of Korea)

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4. Manuscript II: Mental Health and Human rights

Abstract

Background: Systematic, during the last decades widespread gross human rights violations, have continued to be committed by North Korean institutions and officials. However, little is known about the mental health consequences of long-term human rights violations on North Korean survivors.

Methods: A retrospective, cross-sectional survey was conducted among 383 recently displaced North Korean refugees and migrants through respondent driven sampling in South Korea from September 2014 to January 2015. A full range of human rights violations in North Korea was collected by a human rights violation inventory (HRVI-NK), and symptoms of PTSD, anxiety and depression were measured using the Harvard Trauma Questionnaire and Hopkins Symptom Checklist. Multivariate logistic regression models were performed to determine the association between human rights violations and poor mental health status after adjustment of resilience, traumatic experience, and other factors related to forced migration and resettlement.

Results: The study provided data on the elevated symptom scores of anxiety (60.1%, CI.54.3-65.7) and depression (56.3%, CI.50.8-61.9), and symptom criteria for PTSD (22.8%, CI.18.6-27.4) among North Korean refugees and migrants. Psychiatric symptoms were not only associated with traumatic events such as rape, human trafficking, or natural disaster, but also with the systematic denials of political and civil rights (Anxiety Adj.OR=15.64, P<.001; Depression Adj.OR=11.51, P<.001; PTSD Adj.OR=17.34, P<.05), and social and economic rights (Anxiety Adj.OR=5.09, P<.001; Depression

Adj.OR=3.78 , P<.01; PTSD Adj.OR=5.07, P<.05). Household wealth in North Korea was associated with more symptoms of depression (Adj.OR=4.77, P<0.01) and PTSD (Adj.OR=5.33, P<0.01). Trust with generalized others and social engagement were significant resilience factors that were associated with lower symptoms of depression (Adj.OR=0.63, P<0.01; Adj.OR=0.59, P<0.001), PTSD (Adj.OR=0.65, P<0.05; Adj.OR=0.69, P<0.05), and anxiety (social engagement only Adj.OR=0.65, P<0.01).

Conclusion: This study provides epidemiological evidence of systematic and widespread gross human rights violations in North Korea and their long-term mental health consequences among North Korean refugees and migrants. These findings suggest that we need to pay more attention to human rights in regard to mental health determinants in vulnerable populations and to adjust human rights frameworks for public health interventions in affected communities.

4.1 Introduction

North Korea is routinely listed as one of the worst countries in matters concerning humanitarian and human rights.[1, 2] Twenty years ago, the collapse of the socialist economy, together with natural disasters, caused one of worst famines in recent history, resulting in widespread human suffering and substantial population displacement in North Korea.[3, 4] Food rations were substantially reduced in the northeastern area of North Korea, which had always been the most marginalized.[4-7] The famine triggered numerous border crossings, especially along the northeastern border of China.[8, 9] Finally, the economic crisis under international sanctions has led to substantial social system failures and a dysfunctional public distribution system.

Despite transformative social changes in the last 20 years, the totalitarian nature of the political system in North Korea has been preserved.[10] Systemic, widespread gross human rights violations continue to be committed by North Korean institutions and officials.[5, 11-13] Findings from the United Nation's Commission of Inquiry on Human Rights indicated that North Koreans constantly experience torture, inhuman treatment; discrimination, arbitrary arrest, detention, executions, and enforced disappearance; and complete denial of freedom of thought, expression, and religion or freedom of movement and residence.[14] Political violence and discriminatory policies are not often considered as traumatic events but are still human rights violations that directly and indirectly affect human health.[15-18]

Numerous studies have examined the prevalence of mental health problems and their associations with traumatic events in the context of humanitarian crises, such as natural disaster, wars, and conflicts.[19-24] However, fewer studies have looked at these mental health risks within a comprehensive human rights framework. While systematic and gross human rights violations had been normalized in everyday life, and deeply affected the psychosocial environment of North Koreans, little is known about whether and how the human rights violations function as significant determinants of poor mental health. The aim of this study therefore is to examine how political and social determinants, in the form of human rights violations, are associated with depression, anxiety and PTSD.

4.2 Method

In collaboration between the Centers for Disease Control and Prevention (CDC) and the Korean Institute for National Unification, a retrospective, cross-sectional survey was conducted among 383 North Korean refugees and migrants in South Korea in 2014-2015.

This study aimed to measure the prevalence of posttraumatic stress disorder (PTSD), anxiety, and depression among recently displaced North Korean refugees and migrants and their association with a wide range of human rights violations in North Korea.

Sampling design

The study included adult (≥ age 18) North Korean refugees and migrants in Seoul, Incheon, and Kyounggi-do in South Korea. To reflect the recent situation in North Korea, we recruited only those who resettled in South Korea between 2009 and 2014. Given the hard-to-reach nature of the North Korean refugee population in urban communities, the survey incorporated a respondent-driven sampling (RDS), a peer-driven chain referral system that aims to reduce biases associated with traditional chain-referral sampling. Respondent driven sampling has been used successfully with various hidden populations, including urban refugees.[25-28]

Using information from key informant interviews with North Korean refugees, governmental and NGO workers, health professionals, and human rights experts, we selected 10 North Korean refugees to function as recruiter seeds. According to the RDS procedure, we provided three coupons to each seed to recruit other eligible participants from their social networks into the study. Every new participant that completed the interview was provided three coupons for further recruitment. During each interview, we asked about the size of their social network in the refugee community i.e. their reciprocal relationships with other North Korea refugees resettled in South Korea in last five years. The network referral patterns (who recruited whom) were tracked based on coupon numbers. Recruitment waves were repeated until reaching equilibrium on key variables.

Recruitment of the entire sample was completed with 383 individuals. The sex ratio in the final sample without ten seeds of participants was 71.85% women and 28.15% men, similar to the estimated 71.8% women and 28.2% men in the entire refugee population resettled since 1999.[29] Table 1 displays socio-demographic characteristics of respondents

Interview procedure

Ten North Korean refugees who had experience administrating surveys and were trusted among local refugee communities were trained as interviewers to administer a structured questionnaire for participants from urban communities. When new participants contacted the survey team through the contact information on a coupon, we scheduled an interview at a location chosen by the participant. Before beginning the survey, a trained interviewer explained the study objectives, meaning, expected time required, and potential risks of study participation, and that there would be negative consequences of not participating. Individual informed consent was obtained in writing and kept with study records. Each interview followed a standardized protocol and was conducted with a structured questionnaire, taking 60-90 minutes to complete. Study participants received $16 in compensation per interview for their time.

Measures

Figure 4.1 shows the conceptual framework of human rights violations, displacement, and mental health among North Korean refugees and migrants. The Human Rights Violation Inventory in North Korea (HRVI-NK) was designed to provide information on an extensive range of gross human rights violation in North Korea. We first conducted an in-depth review of human rights literature on North Korea. Then, we collected qualitative

information from key informants about human rights violations in North Korea using open-ended questions, and a total of 34 North Korean refugees and migrants with semi-structured questionnaires that took 90 – 180 minutes. Focus group discussions were conducted with an expert panel of human rights scholars, NGO workers, a psychiatrist, and refugee health practitioners. This information was used to develop a human rights violations inventory that were piloted with 10 North Korean refugees and migrants before finalizing the survey.

The HRVI-NK covered individual and community exposures to gross and systemic violations of human rights ranging from political and civil rights (referred to as negative rights) to social, economic, and cultural rights (referred to as positive rights). Political and civil rights violations included 19 items (Cronbach α=0.83): torture and inhuman treatment (two items, α=0.80); discrimination (three items, α=0.47); freedom of movement and residence (four items, α=0.59); freedom of thought, expression, and religion (six items, α=0.71); and arbitrary arrest, enforced disappearance, and detention (four items, α=0.56). Social, economic, and cultural rights included 13 items (Cronbach α=0.87): the right to food (five items, α=0.82); the right to health (three items, α=0.59); forced labor (three items, α=0.63); and the right to labor (two items, α=0.46). We also included six items related to other traumatic events not committed by state actors (Cronbach α=0.58). Participants endorsed individual events with a ten-year recall period according to the four options: directly experienced (individual level), witnessed (community level), heard (community level), or none. Each human rights variable was characterized as exposed if participants answered yes to any of the relevant items or as unexposed if they answered no to all items. Only results based on the dichotomized

variables were reported in both individual and community level violations.

In addition to the Human Rights Violation inventory in North Korea, we also identified variables related to traumatic events related to forced migration based on previous studies on North Korean refugees [19, 20, 30]. Traumatic events during displacement from North Korea were measured with 19 items, such as lack of food, family separation, arrested by border control, and having one's life at risk due to gun fire in the North Korea border. Traumatic events in China or other third countries such as Thailand were measured with another 19 items, including detention by police or in prison, discrimination based on illegal status, human trafficking, and rape.

The mental health questionnaire consists of some standard instruments to assess depression, anxiety, PTSD, and social function. PTSD symptoms based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) were measured by the Harvard Trauma Questionnaire (HTQ).[31] The Harvard Trauma Questionnaire was originally developed to screen trauma-related symptoms of refugee populations but has been used and validated in other contexts of conflict and natural disaster.[32-34] We followed a scoring algorithm proposed in the HTQ manual that requires a score of 3 or 4 on at least one of four symptoms of re-experience, at least three of seven symptoms of avoidance and numbing, and at least two of five arousal symptoms.[32, 35] Anxiety and depression were measured the Hopkins Symptom Checklist, a screening tool including 10 items for anxiety and 15 items for depression.[36, 37] This self-report symptom inventory is defined to have a 1.75 threshold score predict anxiety and depression,[31, 38-40] though the optimal threshold score has not been validated in the context of North Korean refugees. Social

function was measured with major six items selected from the 36-Item Short-Form Health Survey (SF-36) that assessed general self-perceived health, bodily pain, role-emotional functioning, and social functioning.[41, 42]

We collected information on resilience, referring to the ability to sustain or regain mental health and social function despite significant adverse experience.[43] The complex interplay of biological, social, and cultural factors makes it difficult to measure resilience.[44] We selected four items related to positive adaptation that included self-esteem, self-control, social engagement, and trust in generalized others.[45, 46]

We collected information on the political status and socioeconomic position in North Korea. The political status of respondents was systemically measured by his or her *songbun*, a state assigned social class based on the family background that reflects the assumed political loyalty of an individual's family. All North Koreans are categorized broadly into three broad classes corresponding to the core (*Heksim)*, basic (also known as *Dongyo or* wavering), and hostile (*Jekdae*) class with approximately 51 more specific categories in the s*ongbu*n system.[12] In addition, we asked respondents about their family members' membership in the Worker's Party of Korea (WPK), another visible indicator of a high political status of an individual and her/his family.

Regarding socioeconomic positions,given the unstable and transitional economy in North Korea, we collected information about household wealth and daily income level (USD1 above or below) in one year and ten years before displacement. A household wealth index was generated through principal components analysis (PCA) of the household's ownership of 14 consumer items that were identified during the formative stage of the

study. In addition, we asked whether respondents or household members were engaged in market activities and whether they received remittances from outside North Korea.

Demographic information included the region of residence, type of region (urban or rural), and the state-assigned job, education level, left behind children age, gender, and marital status. In addition, information was collected on forced migration patterns (when, duration, frequencies) as well as deportation history and the reason for leaving North Korea.

All measures used in this survey were designed as part of a self-report questionnaire, but a trained refugee interviewer provided assistance if needed. Prior to data collection, all instruments were translated into Korean and back-translated into English to ensure cultural and lingual appropriateness and were piloted with the group of North Korean refugees. Total eight of human rights experts, a psychiatrist, psychologists, and NGO workers participated in a final evaluation of the questionnaires.

Statistical analysis

Prevalence estimates and confidence intervals (CIs) were adjusted for respondent-driven sampling using RDSAT version 7.1. Regression analyses were performed using STATA 13ME.[47] Standard exploratory data analysis procedures were used to explore descriptive components involving RDSAT-adjusted and unadjusted (crude) estimates of interests. Homophily (range: -1, 1), the tendency of people to recruit people similar to themselves, was assessed with the main variables of interest. Seeds were not included in the descriptive analyses.

The independent variables were the full range of human rights violations, political status and socioeconomic position in North Korea, and resilience factors. Dependent variables included clinical levels of anxiety, depression, and PTSD. To identify a significant association of political, economic and human rights factors with mental health status, a bivariate logistic regression model was used. In bivariate and multivariate regression, $P<.05$ was considered statistically significant. We also used demographic variables such as age and gender education as explanatory variables, which are known to be associated with anxiety, depression, and PTSD.[23] The variables of greatest interest were mental health status and exposure to human rights violations in North Korea.

Multivariate logistic regression was performed with the main variables of interests that showed significant associations in the bivariate analysis. The final model was identified with both forward stepwise selections of these variables of interests with a p-value set to 0.1. Political and socioeconomic variables that were statistically significant were included in the final multivariate logistic model relating human right violations to mental health status. While RDS-adjusted and unadjusted prevalence estimates were used in the descriptive analysis, the interpretive analysis presented shows RDS-adjusted estimates. Seeds were not included in regression analysis.

Ethical Approval

The study protocol was approved by the Dankook University Institutional Review Board (IRB) in Korea and, as secondary data analysis, by the Institutional Review Board (IRB) of Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland.

4.3 Results

Patterns of human rights violation

Complete data on exposure to 32 human rights violations and six traumatic events in North Korea showed a high prevalence of political and civil rights violations (89.8%); social and economic rights violations (85.8%); and traumatic events (63.8%). Table 4.2 displays the prevalence of nine major categories of human rights violations reported by 373 respondents excluding the 10 participant seeds. The totalitarian nature of the political system is reflected in the frequency of political and civil rights violations: 283 (75.9%) respondents reported being restricted in travel and movement or having experienced banishment or forced separation with family. Two hundred forty-one (64.6%) reported being restricted their freedom of thought, expression, and religion and under constant surveillance and various kind of persecutions. Furthermore, 111 (29.8%) respondents reported undergoing severe beatings by police or security officers for more than 10 minutes (25.5%) or tortured by an intentional actor, causing physical or psychological pain as a method of threat or punishment (21.7%). Disappearance (19%) or death (23.6%) of family members by state actors was also common in North Korea. Sixty-three (16.9%) respondents experienced more than 10 of the total of 19 political and civil rights violations, while 38 (10.2%) reported no human rights violations.

Reflecting chronic economic crisis, 260 (69.7%) respondents experienced household hunger (64.9%), or life-threatening starvation that endangered their life (41.6 %.) or caused the death of a family member (20.6%). Also, 203 (54.4%) reported having a severe sickness (36.7%) or death of a family member (23.6%) who did not have adequate health care. Forced labor was common in North Korea (70.8%). Means of livelihood,

such as market activities, were systemically threatened by state actors (45.8%). One hundred thirty-four (36.0%) respondents reported more than seven items of a total of 14 items related to social, economic, and cultural rights violations, while 53 (14.2%) reported no human rights violations.

North Korean respondents reported traumatic events that were not committed by state actors in North Korea (63.8%) and that were experienced during forced migration in China and 3rd countries (93.6%). Social and cultural discrimination and social exclusion were also common after arriving in South Korea (Table 4.3).

Mental health, social functioning, and resilience

The prevalence of anxiety, depression and PTSD symptoms estimated and mean scores on the social functioning and resilience factors are shown in Table 4.4. Among the 373 North Korean refugees and migrants who responded to items in the Johns Hopkins Symptom Checklist, 60.7% had elevated anxiety symptoms scores. Another 57.3% of respondents had elevated depression symptom scores; 22.8% of respondents met the symptom criteria for PTSD such as arousal (e.g., irritability, difficulty concentrating, excessive jumpiness), avoidance, and re-experiencing symptoms. Homophily was close to zero in all anxiety, depression, and PTSD symptoms, and there was no significant difference between crude and RDS-adjusted estimates.

The estimated means score of the SF-36 were 30.0 on general health perception (95% CI: 27.5-32.5); 73.1 on social function (95% CI: 70.5-75.6); 48.4 on bodily pain (95% CI: 44.8 -52.1); and 58.6 on role emotional functioning (95% CI: 56.1-61.0) using a scale from 1 to 100. For resilience factors on a scale of 1 to 5, the mean score for trust with

generalized others was 3.6 (95% CI: 3.5-3.7); the mean for self-esteem was 4.1 (95% CI: 4.0-4.1); the mean for self-control was 3.9 (95% CI: 3.8-4.0); and the mean for social engagement was 3.5 (95% CI: 3.4-3.6). A higher score represents better functioning in these schemes.

Bivariate and multivariate analysis

The association between mental health symptoms and human rights violations was examined in bivariate (Table4.5) and multivariate logistic regression models (Table 4.7, Table 4.8). Anxiety, depression, and PTSD symptoms were presented as the major outcomes on the major categories of human rights violations in North Korea and other adverse events in the context of forced migration.

In the bivariate analysis, the symptoms criteria of PTSD were strongly associated with political and civil rights violations, especially related to torture and inhuman treatment (OR=2.38, P<.001); freedom of movement and residence (OR=4.26, P<.001); freedom of thought, expression and religion (OR=2.63, P<.01); arbitrary arrest, enforced disappearance and detention (OR=2.61, P<.001); and social economic and cultural rights violations related to rights to food (OR=3.36, P<.001), health (OR=3.09, P<.001), and livelihood (OR=3.16, P<.001). Depressive symptoms were significantly higher among respondents reporting human rights violations related to freedom of movement and residence (OR=2.10, P<.01) and to the rights to food (OR=2.36, P<.001), health (OR=1.73, P<.01) and livelihood (OR=2.22, P<.001). Anxiety symptoms were associated with torture and arbitrary arrest (OR=1.71, P<.05), and restriction on movement and residence (OR=1.61, P<.05) as well as with violations of rights to health (OR=3.25,

P<.001) and labor (OR=1.79, P<.01). Rates of these conditions had strong dose-response relationships per number of exposures to human rights violations: between political and civil rights violation and symptoms of PTSD (OR1.12, P<.001), depression (OR1.11, P<.01) and anxiety (OR1.20, P<.001); and between social and economic rights violations and symptoms of PTSD (OR1.13, P<.001), depression (OR1.15, P<.05) and anxiety (OR1.25, P<.001) Regarding other traumatic experience not committed by state actors, respondents who were exposed to more traumatic events in North Korea were more likely to report PTSD (4-6 items: OR=14.68, P<.001), depression (4-6 items: OR=8.40, P<.01), and anxiety (4-6 items: OR=6.28, P<.01) than those who were not exposed. Those who reported more traumatic events during forced migration had much more symptoms of PTSD (30-38 items: OR=24.48; 20-29 items: OR=10.23, all P<.01) than those who reported no event. Discriminations or social exclusion in resettlement was not statistically associated with mental health symptoms (Table 4.5).

In the multivariate logistic regressions, symptoms of anxiety (Adj.OR=15.64, P<0.001), depression (Adj.OR=11.51, P<0.001), and PTSD (Adj.OR=17.34, P<0.05) were significantly higher among respondents who were exposed to more political and civil rights violations compared with those who were exposed to no violation, after adjusting covariates of political and economic status in North Korea, social discrimination in resettlement, resilience factors, and other socio-demographic variables such as age, gender, education, residence, and resettlement years (Table 4.7). Exposure to social, cultural and economic rights violations was also strongly associated with more symptoms of anxiety (Adj.OR=5.09, P<0.001), depression (Adj.OR=3.78, P<0.01), and PTSD (Adj.OR=5.07, P<0.05) after adjustment for same variables (Table 4.8).

As Table 4.7 showed, trust with generalized others and social engagement were significant resilience factors that were associated with lower symptoms of depression (Adj.OR=0.63, P<0.01; Adj.OR=0.59, P<0.001), PTSD (Adj.OR=0.65, P<0.05; Adj.OR=0.69, P<0.05), and anxiety (social engagement only Adj.OR=0.65, P<0.01). Respondents within the lowest quintile of household wealth in North Korea were more likely to report symptoms of depression (Adj.OR=4.77, P<0.01) and PTSD (Adj.OR=5.33, P<0.01). Symptoms of PTSD of the group with the political reason for migration was significantly higher than the other groups (Adj.OR=3.96, P<0.001). Being male was significantly associated with lower likelihood of depression (Adj.OR=0.36, P<0.01) and PTSD (Adj.OR=0.42, P<0.05). Older age was associated with increases in all mental health symptoms, while years of resettlement were only associated anxiety.

4.4 Discussion

North Korea refugees and migrants experienced systematic and gross human rights abuses in North Korea and suffered from traumatic events during forced migration in China, and are continuously faced with social discrimination in South Korea.[10, 12, 48-50]This study found significant associations of mental health symptoms with traumatic events in forced migration and, significantly with wide range of human rights violations in North Korea. Prevalence of depression (57.3%), anxiety (60.6%), and PTSD symptoms (22.8%) among North Korean refugees and migrants were notably high, when compared with that of major complex humanitarian emergencies[23, 24, 51-54] and even slightly higher than other North Korean refugee studies that had less access to this hidden population given simple convenience sampling.[20, 21, 30, 55]. Those mental health symptoms were statistically associated with human rights violations in North Korea and traumatic

experiences during forced migration in China.[46] This study found trust and social engagement was a key resilience factor that mitigated the mental health impacts. These results are consistent with other mental health studies showing a statistical association of depression, anxiety, and PTSD with traumatic events and resilience factors.[56] [57-60]

This study is unique in that we measured a wide range of human rights violations not only as potentially traumatic events,[61, 62] but also as political determinants of mental health[63]. Compared to South Koreans,[64] psychiatric symptoms were not only prevalent among North Korean refugees and migrants who experienced traditional traumatic events such as torture, rape, or starvation or death of a family member, but also among those who had suffered from human rights violations related to freedom of movement, freedom of thought and expression, or rights to livelihood. North Korean refugees and migrants had been exposed to oppressive and discriminative social system through their life in North Korea.[10] These study results suggest that such systematic human rights violations can have long-term consequences on the well-being of a survivor and a community.[65]

These findings may challenge the traditional understanding of refugee health that has paid more attention to the traumatic experience of forced migration than political and social determinants of health that had been embodied prior to displacement. The human rights violation is a significant determinant of poor mental health in certain population, but it is outside the usual remit of psychiatric and social epidemiology.[66-69] The finding of this study may expand our view of certain traumatic events to include political determinants of mental health in the past and present. Policy makers and health professionals need to pay more attention to human rights situations in regard to mental

health determinants in vulnerable populations and to adjust human rights frameworks for public health interventions. Such evidence helps to identify mental health risk factors related to human rights abuses at an early stage of displacement or resettlement and to establish comprehensive medical and psychosocial assistance programs in affected communities.

Limitations

North Korean refugees and migrants in urban communities are a hard to reach population due to their concerns about thesecurity of families left behind in North Korea. This study adopted RDS methods to reach them, but limitations inherent in RDS methods all apply to this study.[70-72] In addition, the findings of the study only represent the North Korean refugees and migrants resettled in South Korea between 2009 and 2014; even if the RDS methods managed to capture a representative sample of the refugee population, the results are not necessarily generalizable to all North Koreans.

In particular, survival bias is significant in a retrospective study of the refugee population, which could have resulted in under-representation of those who were exposed to more severe human rights abuses in North Korea. For example, a survivor of severe human rights violations, such as a political prisoner, would find it very difficult to flee North Korea, and death related to human rights abuses would not be included in the refugee samples. Similarly, survival bias could result in under-representation of those with poor mental health status because they may be less likely to escape North Korea. Nonetheless, the findings of our survey may be helpful to understanding trends and patterns of human rights violations and their mental health consequences on the North Korean population,

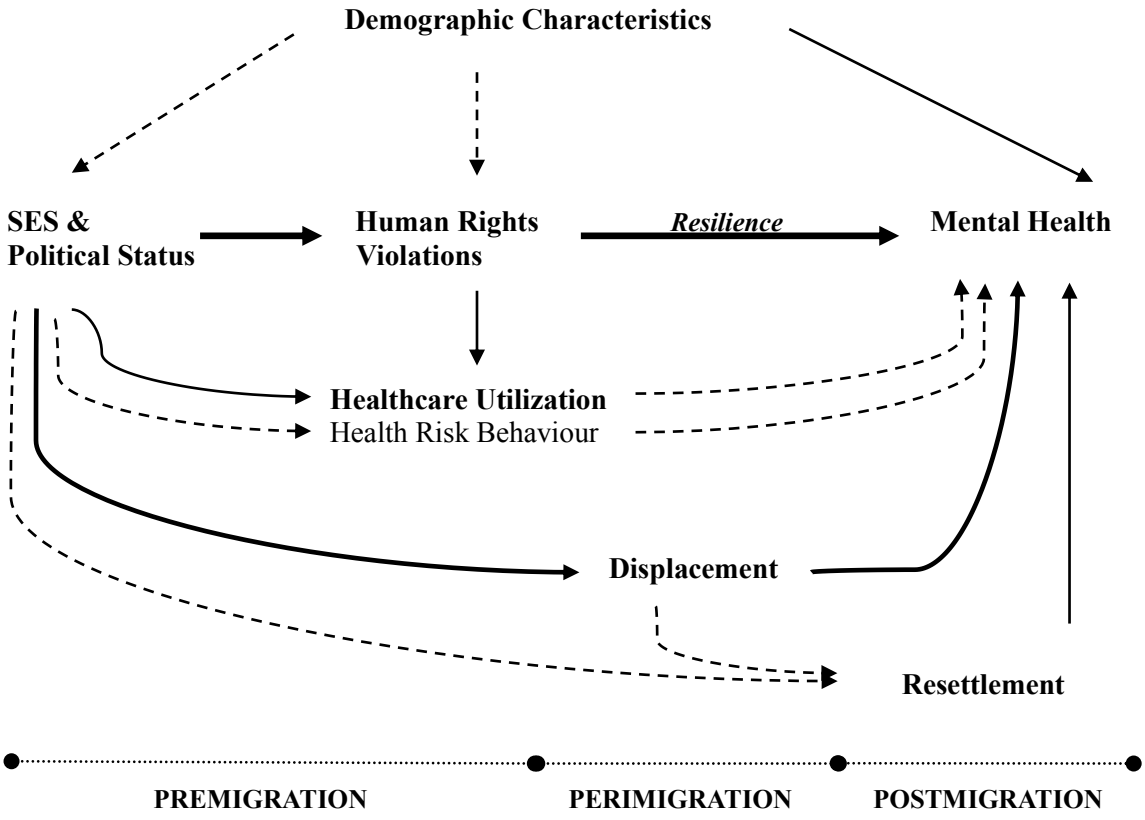
given no access to North Korea. There was no significant difference in key variables by reason for displacement, broadly categorized as refugees (political motivation) and migrants (economic or family invitation).

Several methodological limitations, however, need to be considered in the interpretation of the findings. First, the mental health instruments, such as HTQ and HSCL, are not for clinical diagnostic measures, although they were validated in various contexts of political violence, conflict, and forced migration. Second, temporality between some key variables was not established in the cross-sectional design. Third, the long recall period may create a bias towards the null for associations presented in this study, although it should be less difficult to remember human rights violations due to the intensity of traumatic memory.

4.5 Conclusion

This study provides epidemiological evidence of systematic human rights violations in North Korea and their long-term mental health consequences among North Korean refugees and migrants. It is timely and significant, not just to understand the impact on the refugee population, but because it may offer insight into human rights in regard to mental health determinants of the North Korean population at large. These findings suggest the need for a collaborative response from human rights and humanitarian actors to address widespread human rights violations and to adjust human rights frameworks for public health interventions.

Figure 4.1 Directed acyclic graphs (DAGs) of human rights violations, displacement, and mental health of North Korean refugees and migrants



***Demographic Characteristics:** socio-demographic factors in NK, displacement, and SK; **Political Status**=political status in North Korea, such as *songbun* and Korea Labor party membership; **SEP**=socioeconomic position in North Korea, such as income, wealth, and market activity; **HRVs**=human rights violations in North Korea; **Mental Health**=mental health of North Korean refugees in resettlement including depression, anxiety, PTSD, and social function; **Displacement**=perimigration (displacement) factors, including displacement history and traumatic events on the North Korean border and China; **Resettlement**=postmigration (resettlement) factors, including resettlement history, social discrimination, and other resettlement stress

Table 4.1 Political status, socioeconomic position, and demographic characteristics of respondents

	Crude	RDS weighted	Homophily
	Freq (%) [95% CI]	Freq (%) [95% CI]	
Gender			
Female	265 (71.6)	67.5 [59.7-73.2]	0.208
Male	105 (28.4)	32.5 [26.8-40.3]	0.116
Age			
18-35yrs	101 (27.5)	29.8 [24.0-37.0]	0.134
35-59yrs.	197 (53.7)	51.3 [44.0-57.3]	0.148
60yrs or above	69 (18.8)	18.9 [13.8-24.4]	0.111
Education*			
Primary school or lower	9 (2.5)	2.1 [0.8-4.1]	-1
Middle/High school	214 (58.2)	61.6 [54.9-66.8]	0.057
College (tech)	77 (20.9)	19.9 [15.1-24.6]	0.107
University or higher	68 (18.5)	16.4 [12.8-22.2]	0.083
Residence*			
Rural	91 (25.9)	25.2 [19,31.5]	0.175
Urban	261 (74.2)	74.8 [68.5,81]	0.106
Marriage			
Married	62 (17)	14.3 [9.9,18.5]	0.075
Widowed	42 (11.5)	10.7 [7.2,14.9]	0.118
Divorced / Separated	90 (24.7)	27.2 [22,33.9]	0.121
Never	27 (7.4)	7.4 [4.4,10.8]	-0.153
Partner in North Korea	144 (39.5)	39.2 [33.1,44.9]	0.062
WPK member, individual*			
Non-member	246 (68.52)	69 [62.2,74.9]	0.147
Member	113 (31.48)	31 [25.1,37.8]	0.145
WPK member, household*			
Non-member	117 (32.23)	32.7 [26.6,37.7]	0.031
Member	246 (67.77)	67.3 [62.3,73.4]	0.043
Household Poverty (income)*			
< USD1/day	197 (61.6)	64 [57.3-70.9]	0.038
> USD1/day	123 (38.4)	36 [29.1-42.7]	0.073
Market Activity*			
Non-engaged	132 (37.93)	37.9 [31.7,45.5]	0.179
Engaged	216 (62.07)	62.1 [54.5,68.3]	0.166
Remittance*			
Not received	127 (37.3)	39 [31.1,44.8]	0.164
Received	216 (63.0)	61 [55.2,68.9]	0.175
Reason of Displacement			
Political reason	108 (28.1)	26.7 [21.6,32.2]	0.091
Economic reason	150 (39.0)	39.2 [32.4,45.9]	0.21
Family invitation	83 (21.6)	26.5 [20.2,31.8]	0.184
Others	44 (11.4)	7.6 [5.2,11.5]	0.058

*characteristics in North Korea

Table 4.2 North Korean refugees and migrants reporting human rights violations in North Korea

	Crude	RDS adjusted
Political and civil rights violation	Freq (%)] [95% CI]	% [95% CI]
Torture and inhuman treatment	111 (29.8) [25.1,34.4]	29.3 [24.7,35.2]
Tortured	81 (21.7) [17.5,25.9]	21.4 [17.3,26.4]
Physical violence by police/security agency	95 (25.5) [21,29.9]	25.6 [20.9,31.4]
Discrimination	186 (49.9) [44.8,55]	49.1 [42.1,53.9]
Political status based	132 (35.4) [30.5,40.3]	33.3 [27.1,37.9]
Gender based	88 (23.6) [19.3,27.9]	23.6 [17.8,29]
Stigma, unspecified	64 (17.2) [13.3,21]	17.6 [12.6,21.7]
Freedom of movement and residence	283 (75.9) [71.5,80.2]	74.6 [68.4,80]
Travel	244 (65.4) [60.6,70.3]	66.5 [60,71.8]
Residence	187 (50.1) [45,55.2]	50.3 [44.1,57]
Banishment	75 (20.1) [16,24.2]	20.3 [15.8,25]
Family separation	122 (32.7) [27.9,37.5]	31.7 [25.6,37.5]
Freedom of thought, expression, and religion	241 (64.6) [59.7,69.5]	63.8 [57.3,69.5]
Surveillance	172 (46.1) [41,51.2]	46 [39.7,52.5]
Religious persecution	10 (2.7) [1,4.3]	3 [1.2,5.1]
Persecution (political opinion)	71 (19) [15,23]	16.7 [12.6,21.3]
Persecution (suspicion of loyalty)	87 (23.3) [19,27.6]	21.5 [17.3,26]
Persecution (political misconduct of family)	66 (17.7) [13.8,21.6]	16.4 [12.5,20.5]
Being target of Ideological attracts	102 (27.3) [22.8,31.9]	27.4 [22.7,32.5]
Arbitrary arrest, disappearance, and detention	231 (61.9) [57,66.9]	60.5 [53.7,66.7]
Imprisonment without legal procedure	102 (27.3) [22.8,31.9]	27 [21.7,32.4]
Disappearance of family member	71 (19) [15,23]	19.7 [14.6,25.2]
Death of family member in detention	88 (23.6) [19.3,27.9]	23 [17.3,29.4]
Public execution (eyewitness)	166 (44.5) [39.4,49.6]	43.7 [37,49.4]
Total Exposure		
0 items	38 (10.2) [7.5,13.7]	10.2 [6.5,13.9]
1- 9 items	272 (73.0) [68.2,77.2]	73.6 [68.8,78.1]
10-19 items	63 (16.9) [13.4,21.1]	16.3 [12.4,20.9]
Social and economic rights violation		
Right to food & related the right to life	260 (69.7) [65,74.4]	66.8 [60.1,73.1]
Household Hunger Scale (FANTA2, three items)	242 (64.9) [60.0,69.7)	60.7 [54.6,67.2]
Life threatening starvation (respondent)	155 (41.6) [36.5,46.6]	40.4 [33.5,46.9]
Life threatening starvation (family member)	77 (20.6) [16.5,24.8]	18.5 [13.4,24.2]
Right to health	203 (54.4) [49.3,59.5]	53.3 [46.7,60.2]
Severe sickness of family without healthcare	137 (36.7) [31.8,41.6]	34.1 [28.1,40.1]
Death of family member without healthcare	88 (23.6) [19.3,27.9]	22.7 [17.4,28.6]
Life threatening due to severe cold	120 (32.2) [27.4,36.9]	33 [26,39.8]
Rights to livelihood	190 (50.9) [45.8,56]	49.5 [41.9,56.1]
Means of livelihood threatened by a state actor	171 (45.8) [40.8,50.9]	45.4 [37.5,52]
No access to legitimate means of livelihood	77 (20.6) [16.5,24.8]	20.5 [15.4,26.2]
Forced Labor	264 (70.8) [66.1,75.4]	70.3 [64.3,75.9]
Involuntary works for WPK or army	175 (46.9) [41.8,52]	47.9 [41.9,53.9]
Involuntary works in detention	93 (24.9) [20.5,29.3]	24.8 [19.6,30.4]
Involuntary works without compensation	242 (64.9) [60,69.7]	64.6 [57.2,70.2]
Total Exposure		
0 items	53 (14.2) [11,18.2]	16.2 [11.8,21.5]
1- 6 items	186 (50.0) [44.8,54.9]	49.9 [43.4,55.9]
7-13 items	134 (36.0) [31.2,40.9]	33.9 [27.2,40.5]

Table 4.3 Traumatic events and social distress in countries of origin, displacement, and resettlement

Traumatic events and social distress	**Crude**	**Adjusted**
Country of Origin (North Korea)	Freq (%) [95% CI]	% [95% CI]
Traumatic events by non-state actors (6 items)		
Rape	30 (8.0) [5.3,10.8]	7.6 [4.5,10.9]
Human trafficking	49 (13.1) [9.7,16.6]	11.9 [7.6,16.3]
Bodily injury due to physical violence	103 (27.6) [23.1,32.2]	27.0 [22.3,32.6]
Bodily injury due to accident	58 (15.5) [11.9,19.2]	15.7 [11.4,19.8]
Natural disaster	150 (40.2) [35.2,45.2]	39.5 [33.2,45.5]
Missing family members left for seeking food	99 (26.5) [22,31]	27.5 [21.8,32.5]
Total Exposure		
0 items	135 (36.2) [31.5,41.2]	16.2 [11.9,21.4]
1-3 items	210 (56.3) [51.2,61.3]	49.9 [43.5,56.2]
4-6 items	28 (7.5) [5.2,10.7]	33.9 [27,40.5]
Forced Migration (China and 3rd Countries)		
Traumatic Events in Forced Migration (38 items)		
0 items	24 (6.43) [4.3,9.4]	6.0 [3.5,8.7]
1- 9 items	200 (53.62) [48.5,58.6]	52.7 [45.1,59.2]
10-19 items	119 (31.9) [27.3,36.8]	31.9 [26.7,38.4]
20-29 items	24 (6.43) [4.3,9.4]	7.4 [4.5,10.5]
30-38 items	6 (1.61) [0.7,3.5]	2.0 [0.3,4.9]
Resettlement (South Korea)	Mean (0-5) [95% CI]	
Social discrimination	2.8 [2.74,2.87]	
Social exclusion	2.61 [2.54,2.67]	
Cultural discrimination	2.8 [2.73,2.87]	

Table 4.4 Mental health and psychosocial status among North Korean refugees and migrants

	Crude	RDS weighted	Homophily
Mental Health Status	% [95% CI]	% [95% CI]	
Anxiety symptoms	60.6 [55.4, 65.6]	60.1 [54.3, 65.7]	- 0.016 (+)
Depression symptoms	57.4 [52.2,62.5]	56.3 [50.8, 61.9]	- 0.015 (+)
PTSD symptoms	22.8 [18.6, 27.4]	22.5 [17.7,27.4]	- 0.098 (+)
Social Function(SF-36)	Mean (0-100) [95% CI]		
General health perception	30.0 [27.5, 32.5]		
Social functioning	73.1 [70.5, 75.6]		
Bodily pain	48.4 [44.8, 52.1]		
Role emotional functioning	58.6 [56.1, 61.0]		
Cognitive scheme related to resilience	Mean (0-5) [95% CI]		
Trust with generalized others	3.6 [3.5,3.7]		
Self-esteem	4.1 [4,4.1]		
Self-control	3.9 [3.8,4]		
Social engagement	3.5 [3.4,3.6]		
Mean (SD, ranged 1-5)	3.8 [3.7,3.8]		

Table 4.5 Bivariate logistic regression: mental health, human rights violations, and other social distress

	Anxiety	Depression	PTSD
	OR [95%CI]	OR [95%CI]	OR [95%CI]
Political and civil rights			
Torture and inhuman treatment	1.71* [1.07,2.74]	1.39 [0.89,2.19]	2.38*** [1.42,3.99]
Discrimination	1.26 [0.83,1.91]	1.04 [0.69,1.58]	1.46 [0.88,2.41]
Movement and residence	1.61* [1.01,2.57]	2.10** [1.31,3.35]	4.26*** [1.93,9.40]
Thought, expression, religion	1.19 [0.77,1.84]	1.18 [0.77,1.82]	2.63** [1.44,4.78]
Arrest, disappearance, detention	1.41 [0.92,2.16]	1.4 [0.92,2.14]	2.61*** [1.47,4.60]
Sub-Total Exposure			
0 items	1 [Reference]	1 [Reference]	1 [Reference]
1- 9 items	1.47 [0.74,2.94]	2.23* [1.09,4.59]	4.11 [0.93,18.09]
10-19 items	8.12*** [2.94,22.42]	6.83*** [2.71,17.19]	14.74*** [3.16,68.71]
Per item	1.12*** [1.05,1.18]	1.11*** [1.05,1.17]	1.20*** [1.13,1.28]
Social and economic rights			
Rights to food	1.47 [0.94,2.30]	2.36*** [1.51,3.70]	3.36*** [1.72,6.56]
Rights to health	3.25*** [2.10,5.03]	1.73** [1.14,2.63]	3.09*** [1.77,5.37]
Rights to livelihood	1.79** [1.17,2.73]	2.22*** [1.45,3.38]	3.16*** [1.83,5.44]
Forced labor	0.95 [0.60,1.51]	1.69* [1.08,2.66]	1.72 [0.95,3.11]
Sub-Total Exposure			
0 items	1 [Reference]	1 [Reference]	1 [Reference]
1- 6 items	1 [0.54,1.84]	1.1 [0.60,2.03]	1.76 [0.61,5.05]
7-13 items	2.42** [1.25,4.70]	2.97** [1.53,5.74]	6.73*** [2.40,18.92]
Per item	1.13*** [1.06,1.20]	1.15*** [1.09,1.23]	1.25*** [1.16,1.34]
Traumatic and social distress			
Traumatic events in North Korea			
0 items	1 [Reference]	1 [Reference]	1 [Reference]
1- 3 items	1.05 [0.68,1.63]	1.27 [0.82,1.97]	2.89** [1.50,5.54]
4-6 items	6.28** [1.71,23.06]	8.40** [2.29,30.82]	14.68*** [5.53,38.94]
Per item	1.35*** [1.13,1.60]	1.45*** [1.21,1.73]	1.78*** [1.47,2.16]
Traumatic events in displacement			
0 items	1 [Reference]	1 [Reference]	1 [Reference]
1- 9 items	0.65 [0.26,1.64]	0.76 [0.31,1.87]	1.21 [0.32,4.56]
10-19 items	1.18 [0.45,3.09]	1.25 [0.49,3.19]	1.91 [0.50,7.32]
20-29 items	12.76* [1.63,99.64]	3.81 [1.00,14.56]	10.23** [2.30,45.49]
30- 38 items	2.18 [0.27,17.55]	2.81 [0.35,22.38]	24.48** [2.52,238.20]
Per Item	1.06*** [1.03,1.10]	1.05** [1.02,1.09]	1.10*** [1.06,1.14]
Social distress in resettlement			
Social discrimination	1.14 [0.82,1.60]	1.36 [0.97,1.89]	1.25 [0.84,1.86]
Social exclusion	1.2 [0.86,1.66]	1.1 [0.80,1.51]	1.24 [0.84,1.84]
Cultural discrimination	1.34 [0.97,1.86]	1.23 [0.89,1.70]	1.15 [0.78,1.70]

*p<0.05; **p<0.01; ***p<0.001

Table 4.6 Bivariate logistic regression: resilience factors associated with mental health

	Anxiety	Depression	PTSD
	OR [95%CI]	OR [95%CI]	OR [95%CI]
Resilience			
Trust with generalized others	0.78* [0.62,0.98]	0.66*** [0.52,0.83]	0.79 [0.61,1.03]
Self-esteem	0.96 [0.73,1.25]	0.73* [0.56,0.96]	0.89 [0.65,1.23]
Self-control	0.87 [0.67,1.12]	0.83 [0.64,1.06]	0.87 [0.65,1.17]
Social engagement	0.73** [0.60,0.90]	0.64*** [0.52,0.79]	0.72** [0.57,0.92]
Mean (SD, ranged 1-5)	0.60** [0.41,0.87]	0.41*** [0.28,0.60]	0.57* [0.36,0.89]

*p<0.05; **p<0.01; ***p<0.001

Table 4.7 Multivariate logistic regression: mental health and political and civil rights

	Anxiety	Depression	PTSD
	OR 95%CI	OR 95%CI	OR 95%CI
Political and civil rights violation			
0 items	1 [Reference]	1 [Reference]	1 [Reference]
1- 9 items	1.92 [0.76,4.86]	2.42 [0.90,6.51]	8.12 [0.94,69.93]
10-19 items	15.64*** [3.85,63.47]	11.51** [3.12,42.45]	17.34* [1.80,167.49]
Political and economic characteristics			
Songbun (hostile vs. core class)	0.27 [0.06,1.14]	0.28 [0.06,1.24]	0.19* [0.04,1.00]
Workers' Party of Korea member	0.65 [0.32,1.29]	0.79 [0.40,1.55]	0.67 [0.29,1.53]
Household wealth (5^{th} vs 1^{st}quintile)	1.23 [0.47,3.23]	4.77** [1.72,13.21]	5.33** [1.60,17.71]
Engaged in market activity	1.16 [0.61,2.22]	1.37 [0.72,2.61]	0.65 [0.31,1.38]
Demographic characteristics			
Gender (male vs female)	0.36** [0.19,0.70]	0.58 [0.30,1.12]	0.42* [0.18,0.99]
Age	1.02* [1.00,1.04]	1.04*** [1.02,1.06]	1.03* [1.00,1.05]
Education	1.03 [0.68,1.56]	1.14 [0.76,1.73]	0.89 [0.56,1.43]
Residence (urban vs rural)	1.55 [0.77,3.12]	0.75 [0.37,1.56]	0.98 [0.42,2.26]
Pyongyang	1 [Reference]	1 [Reference]	1 [Reference]
Northern province	1.1 [0.27,4.45]	0.96 [0.24,3.76]	0.45 [0.10,2.13]
Eastern province	1.34 [0.26,6.88]	1.11 [0.22,5.67]	0.24 [0.04,1.58]
Western province	2.04 [0.36,11.49]	1.46 [0.29,7.41]	0.7 [0.12,4.18]
Migration characteristics			
Migration types (forced vs voluntary)	1.46 [0.70,3.05]	0.73 [0.35,1.52]	3.96*** [1.82,8.60]
Years of resettlement	1.22* [1.02,1.47]	1.14 [0.95,1.37]	1 [0.82,1.23]
Social discrimination in resettlement	1.14 [0.72,1.82]	1.28 [0.79,2.05]	0.98 [0.57,1.70]
Resilience			
Trust with generalized others	0.85 [0.62,1.17]	0.63** [0.46,0.87]	0.65* [0.45,0.95]
Social engagement	0.65** [0.48,0.88]	0.59*** [0.43,0.81]	0.69* [0.49,0.97]

*p<0.05; **p<0.01; ***p<0.001

Table 4.8 Multivariate logistic regression: mental health, social, economic, and cultural rights

	Anxiety	Depression	PTSD
	OR 95%CI	OR 95%CI	OR 95%CI
Social and economic rights violations			
0 items	1 [Reference]	1 [Reference]	1 [Reference]
1- 6 items	1.46 [0.62,3.43]	1.46 [0.63,3.41]	1.37 [0.36,5.27]
7-13 items	5.09*** [1.93,13.42]	3.78** [1.48,9.70]	5.07* [1.31,19.58]
Political and economic position			
Songbun (hostile vs. core class)	0.36 [0.09,1.49]	0.32 [0.08,1.40]	0.25 [0.05,1.30]
Workers' Party of Korea member	0.84 [0.42,1.65]	0.94 [0.48,1.85]	0.84 [0.36,1.96]
Household Wealth (5^{th} vs 1^{st} quintile)	1.24 [0.47,3.27]	4.87** [1.76,13.51]	4.79* [1.42,16.16]
Engaged in market activity	1.04 [0.54,2.00]	1.29 [0.68,2.47]	0.6 [0.28,1.29]
Demographic characteristics			
Gender (male vs female)	0.36** [0.19,0.69]	0.58 [0.30,1.12]	0.46 [0.19,1.09]
Age	1.01 [1.00,1.03]	1.03** [1.01,1.05]	1.02 [1.00,1.05]
Education	1.16 [0.77,1.75]	1.2 [0.80,1.81]	0.96 [0.59,1.54]
Residence (urban vs rural)	1.6 [0.79,3.23]	0.81 [0.40,1.67]	0.94 [0.41,2.18]
Pyongyang	1 [Reference]	1 [Reference]	1 [Reference]
Northern province	0.88 [0.22,3.54]	0.87 [0.24,3.18]	0.47 [0.10,2.21]
Eastern province	1.07 [0.22,5.35]	1.03 [0.22,4.81]	0.26 [0.04,1.66]
Western province	1.71 [0.32,9.28]	1.46 [0.30,7.00]	0.71 [0.12,4.34]
Migration characteristics			
Type of migration (forced vs voluntary)	1.55 [0.76,3.16]	0.78 [0.38,1.59]	3.96** [1.83,8.56]
Years of resettlement	1.43*** [1.17,1.75]	1.04 [0.86,1.27]	1.14 [0.91,1.43]
Social discrimination in resettlement	0.97 [0.60,1.56]	1.13 [0.71,1.81]	0.88 [0.50,1.52]
Resilience			
Trust with generalized others	0.91 [0.66,1.25]	0.68* [0.49,0.94]	0.75 [0.51,1.11]
Social engagement	0.64** [0.47,0.86]	0.58*** [0.42,0.79]	0.64* [0.45,0.93]

*p<0.05; **p<0.01; ***p<0.001

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5 Manuscript III: Health System and Human Rights

Abstract

Background: Over the last 20 years, a chronic economic crisis spurred by international sanctions has led to unstable social changes in North Korea, particularly through the expansion of informal market mechanisms. The socialist health system has been distorted, and a decentralized and unregulated health system has expanded through an informal market. At present, little is known about patterns of health system transition in North Korea, and whether and how health disparities have emerged with changing political and economic inequality.

Methods: A retrospective, cross-sectional survey was conducted from September 2014 to January 2015 among 383 recently displaced North Korean refugees through respondent driven sampling in South Korea. Descriptive analysis was carried out to detail patterns of healthcare utilization. Multivariate and bivariate logistic regressions were performed to identify political economic and human rights elements associated with self-reported morbidity and access to health service

Results: The study highlights inadequate access to health service in informal health markets. Of the 62.9% (CI: 57.8–67.7) of respondents who had an illness within one year prior to displacement, only 37.7% (CI: 30.6–44.3) accessed to health services. This appears to be mainly due to informal medical costs and bribes (53.8%, CI: 45.1-60.8) and a lack of medications and medical supplies in health facilities (39.5%, CI: 33.3-47.1). Informal market (*Jangmadang*) were main income resource for paying medical costs (47.3%, CI: 40.4-55.3) but also places for purchasing medicines and medical supplies

(pharmacies: 60.5%, CI: 53.2-66.9; street stalls: 42.5%, CI: 35.8-49.9). High utilization of narcotic analgesics (53.7%, CI: 45.7-61.2) and methamphetamine (2.7%, CI: 0.3-6.2) were found in informal health market. In multivariate and bivariate logistic regressions, political and civil rights violations were strongly associated with increased odds of self-reported morbidity (Adj.OR=8.88, p<.001), and decreased odds of healthcare access (Adj.OR=0.20, p<.01), especially discrimination (OR=1.90, p<.01; OR=0.61, p<.05), restriction of movement and residence (OR=3.18, p<.001; OR=0.46, p<.01), denials of freedom of thought, expression and religion (OR=1.88, p<.01) and arbitrary arrest, disappearance and detention (OR=2.47, p<.001; OR=0.39, p<.001). Social and economic rights violations were also associated with morbidity and healthcare access, especially rights to livelihood (OR=4.60, p<.001; OR=0.34, p<.001) and forced labor (OR=2.08, p<.01;OR=0.46, p<.01), and food insecurity (OR=2.33, p<.001; OR=0.24, p<.001). In addition, lower household wealth was statistically associated with poor healthcare access (Adj.OR=0.29, p<.01), while a membership of Worker's Party of Korea wasassociated with better healthcare access (Adj.OR=3.07, p<.001). Those who were engaged in black market works were more likely to report morbidity (Adj.OR=2.28, p<.001) and less to healthcare access (Adj.OR=0.30, p<.001).

Conclusion: The socialist health system was scaled back under international sanctions, leaving informal market mechanisms to fill the gap. Health disparities emerged changing political and economic inequalities and accentuating human rights violations in North Korea. Health system reform, with a new financing scheme, is necessary. The North Korean government and international organizations should work to reduce health disparities in this transitioning health system.

5.1 Introduction

Over the last 20 years, an economic crisis with international sanctions has led to substantial social system changes in North Korea, particularly through the expansion of informal market mechanisms.[1, 2] A rapidly expanding local market called as *Jangmadang* resulted in parallel socioeconomic systems for income and accessing essential items in the most remote areas. The state's monopoly on essential items such as food and medicine was weakened under malfunctioning public distribution system (PDS), but the insufficient items were still allocated in a discriminative manner based on *Songbun*, a state-assigned political class categorization with family background.[3-5] Economic inequality newly emerged between disadvantaged and privileged groups in the unstable market.[6] Despite the rapid social transformation, furthermore, the totalitarian political system was preserved. Systematic and widespread human rights violations have been committed by North Korean authorities and officials.[7, 8]

In the public health domain, the socialist health system had provided universal health care through an extensive network of human resource and health facilities in North Korea but scaled back with a chronic funding shortage since the 1990s.[9-11] Although total expenditure on health is increasing from 5.9% of GDP in 2000 to 6.1% in 2010, a 67% funding deficit was still found in prioritized health services in 2013.[12, 13] Critical shortages in essential medicine, medical supplies, and logistical costs were observed in the findings of international organizations.[9, 14] In North Korea, universal health coverage still officially claimed, but in reality severely distorted,[15] leaving the private health expenditure to rely on the informal economy to fill the gap.

At present, little is known about patterns of health system transition in North Korea, and whether and how health disparities emerged with political and economic inequities. What was the impact of the economic crisis with international sanction on the health system? How did health disparities emerge between changing social determinants and power? What was the impact of widespread human rights violations on this? Given political inaccessibility to North Korean population, the Centers for Disease Control and Prevention (CDC) and the Korean Institute for National Unification (KINU) conducted a retrospective, cross-sectional survey among 383 recently displaced North Korean refugees and migrants in South Korea. Using the survey data in the five-year recall period prior to displacement from North Korea, this study investigated the health services utilization experience to answer these questions.

5.2 Methods

Sampling design

In September 2014 and January 2015, a respondent driven sampling (RDS) was used to access North Korean adults (≥ age 18) living in urban communities in Seoul metropolitan area. RDS is designed to reduce the biases associated with traditional chain referral sampling and has been successfully used in various hard to reach populations, including urban refugees.[15-18] Following key informant interviews with North Korean refugees, government officials and NGO workers, we selected 10 North Korean refugees as recruiter seeds and provided them with three coupons each to recruit other eligible participants from their social network. The recruitment waves were repeated until reaching equilibrium on key variables. We traced referral patterns (who recruited whom)

using coupon numbers and the social network size of participants in refugee communities was collected.

To reflect the recent situation in North Korea, we recruited only those who resettled in South Korea between 2009 and 2014. When new participants contacted the survey team through information provided on the coupon, we scheduled an interview at a location chosen by the participant. We used a structured questionnaire with both open and close-ended items that took 60-90 minutes to complete. Each interview was administered by North Korean refugee surveyors who were trusted by the local refugee community and had proven experience conducting surveys. The study objectives, survey items, and potential risks of participation were explained prior to the interviews, and informed consent was obtained. Participants received $16 in compensation for their time and transportation expenses.

Measures

For self-reported morbidity and healthcare access, we first asked about any illnesses of respondents occurring during the year prior to leaving from North Korea and about whether they received appropriate medical services and free health service in most recent illness episode. For details about health service utilization, we collected information on most recent illness episodes (both accessing and not accessing health service) during 5 years prior to displacement which include: If service accessed, we collected information on main symptoms or diagnoses; place of illness; types of healthcare service and health facilities; informal payments and bribes (for diagnosis, operation or others except medication); medication costs (for medicines and medical supplies); other service costs

(meals and heating); resource for medical costs; place to buy medicines and medical supplies, types of medicines. If service not accessed, we collected information on main symptoms or diagnoses; place of illness; type of inappropriate healthcare; reasons of not accessing health service; types of self-treatment, including drug use (methamphetamines called as *Bingdu* in North Korea).

Using human rights violation inventory in North Korea (HRVI-NK) we developed, the study collected respondents' exposure to political and civil rights violations (19 items Cronbach α=0.83) including torture and inhuman treatment (2 items, α=0.80); discrimination (3 items, α=0.47); freedom of movement and residence (4 items, α=0.59); freedom of thought, expression and religion (6 items, α=0.71); and arbitrary arrest, enforced disappearance and detention (4 items, α=0.56). Human rights violations related to forced labor (3 items, α=0.63) and rights to livelihood (2 items, α=0.46) were used for additional indicators of social and economic rights violation.

Data on political status and socioeconomic position were obtained, along with basic demographic information. Political status in North Korea was measured by asking about participant's political status (*Songbun*) and membership in the Worker's Party Korea (WPK). Economic status was mainly characterized by household assets and daily income in North Korea. We collected information of household's ownerships of 14 consumer items that were identified during formative interviews and obtained a wealth index through principal components analysis (PCA). We also asked about whether their household income level was above or below an average of US$1 per day. In addition, we asked whether respondents and/or household members were engaged in black market works. Lastly, we collected socio-demographic data that were frequently used as

indicators for measuring social inequities. This includes the region of residence (where), type of region (urban or rural), state-assigned job, education level, family information, age, gender, marital status and heights/weights. Additionally, basic information on their forced migration patterns (when, duration, frequencies) as well as deportation history and the reason for leaving North Korea was collected.

All instruments used in this survey were designed for self-reporting; however, a trained refugee surveyor administered the questionnaire and provided assistance if needed. All questionnaires were translated into Korean and back-translated to English to ensure cultural and lingual appropriateness and tested by a pilot group of North Korean refugees before implementation. A total of eight human rights experts, a psychiatrist, a psychologist, and NGO workers participated in a final evaluation of the questionnaires.

Statistical analysis

Key estimates of interests and CIs were adjusted for respondent-driven sampling using RDSAT version 7.1. Regression analyses were performed using STATA13ME.[19] The first descriptive analysis focused on presenting self-reported morbidity, healthcare access and detailed patterns of healthcare utilizations (both accessing and not accessing service). Standard exploratory data analysis procedures were used for exploring descriptive components that involve RDS-adjusted and unadjusted (crude) estimates. Homophily (range: -1, 1), the tendency of people to recruit people similar to themselves, was assessed with key variables of interest. Bivariate logistic regression model was undertaken to identify association of self-reported morbidity and healthcare access with political, economic and human rights factors. Multivariate logistic regression was then

performed with key variables of interests that showed a significant association in bivariate analysis (p-value < 0.05). The final model was identified with forward stepwise selection of variable of interests with a p value set to 0.1. Ten seeds were not included in the analysis.

Ethical approval

The study protocol was approved by the Institutional Review Board (IRB) of Dankook University in Korea and, as secondary data analysis, by the Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland.

5.3 Results

A total of 383 North Korean refugees and migrants participated in the survey. Of the final sample without ten seeds of participants, 71.85% were female, and 28.15% were male. This is similar to the sex ratio of the entire North Korean population resettled in South Korea since 1999 (71.8% women and 28.2% men).[20] Participants age 18-35 years, 35-59 years, and 69 years or above accounted for 27.5%, 53.7%, and18.8% respectively of the final sample. Of participants, 28.2 % were displaced due to political persecution, punishment, or discrimination, and can be considered as forced migrants. A total of 71.9% migrated mainly for economic reason or family invitation, without expressing other political motivations. In North Korea, 31.5% of participants were members of the Worker's Party Korea (WPK), and 67.8% had a family member who was a WPK member. A total of 61.6% lived in extreme poverty with a household income under US$1 per day. A total of 74.2% came from urban areas in North Korea, and most North Korean

participants had a middle school or higher level of education, and 18.5% were university educated. Only 2.5% of participants were educated in primary school or lower. There are no significant differences between crude and RDS-adjusted estimates.

Patterns of healthcare utilization

We asked whether respondents and their family members had an illness within one year prior to displacement and whether they received appropriate medical care (Table 5.2). Among 62.4% of respondents reported that they had had a condition needing medical care, but only 34.7% had received medical care. Furthermore, we asked whether they could receive care in free of charge, and whether they had to bribe a health professional or other individual to receive healthcare services. 37.8% were able to obtain any free medical care in North Korea the last time it was needed, but 31.9% needed to bribe someone to receive or better healthcare services.

Respondents were asked to report on the most recent times they could and could not access health services when needed within five years prior to displacement. Despite universal health coverage was officially claimed, out of pocket expenditures were widespread when they accessed to health service (Table 5.3), especially in medical consultation (65.4%), medicines and medical supplies (82.0%), another cost such as meals or heating (75.9%). Respondents could pay informal medical cost with income from black market works (47.3%), the sale of household items (39.8%), supports from relatives or neighbors (19.4%) or borrowed money (17.0%), while only 7.1% reported public distribution system as their income resource for medical cost. The primary reasons for not seeking care were medical cost (53.8%) and a lack of medications and medical

supplies in health facilities (39.5%), followed by with closed health facilities (10.9%), a lack of health professionals (10.0%), and physical distance (7.7%), no permission for healthcare (3.8%), and waiting time (3.2%).(Table 5.4)

In the case of accessing healthcare services (Table 5.3), care seeking was mainly reported for mild respiratory problems such as the flu (28.1%) and mild gastrointestinal problems such as diarrhea or gastritis (16.8%). However, a severe gastrointestinal problem such as appendicitis (11.6%), injury (12.8%), or certain infectious diseases such as TB, typhoid, and hepatitis (8.8%) that required in-patient care, careful out-patient care, or surgery was common. Of those conditions for which care was sought, 47.7% were communicable diseases, 38.9% were non-communicable diseases, and 12.7% were injuries. Most respondents received out-patient (49.6%), or in-patient care (37.6%) but 12.7% received care based on traditional medicine, which is one of formal health sectors in North Korea. Approximately half (53.1%) went to a city or county hospital, and others went to a village clinic (14.1%) or provincial hospital (15.0%). Most respondents reported that they purchased medications and medical supplies from pharmacies (60.5%) or street stalls (42.5%) in the informal market (*Jangmadang*). Only 10.0% could receive them from hospitals or clinics.

Among cases of not accessing health services (Table 5.4), major conditions for which they sought care were mild respiratory such as the flu (49.2%) and gastrointestinal problems such as diarrhea (23.1%). But respondent reported certain infectious conditions including TB, typhoid, and hepatitis (6.4%) and injury (2.6%), heart disease and stroke (2.4%), and pneumonia (1.9%) that required intensive treatment. Communicable diseases

(71.9%) were more common than non-communicable diseases (19.5%) or injuries (2.6%). (30.1%) or respondents reported receiving neither a diagnosis nor treatment. Half (52.1%) reported self-medication without a diagnosis, and 18.2% received a diagnosis but did not receive any treatment. Pharmacy (55.4%) and street stalls (40.8%) in the informal market were major sources of self-treatment, followed by taking traditional medicine (10.6%) or remaining (7.7%) or other person's medicines (3.0%).

Significantly a large percentage of respondents reported narcotic analgesics (53.7%) as self-medication, and 2.7% took methamphetamines as self-medication. 39.7% reported having taken narcotic analgesics after medical consultation, and 1.8% had taken methamphetamines for their medical conditions. Medicines such as NSAIDs, antibiotics, anti-TB drug were widely used without medical consultations (63.5%). Herbal medicine was one of alternative form as both of prescribed treatment (14.9%) and self-medication (11.8%).

Bivariate and multivariate logistic regression

In the bivariate logistic regression, wide range of political and civil rights violations were significantly associated with increased odds of self-reported morbidity (Table 5.6), especially discrimination (OR=1.90, p<.01), restriction of movement and residence (OR=3.18, p<.001), denials of freedom of thought, expression and religion (OR=1.88, p<.01) and arbitrary arrest, disappearance and detention (OR=2.47, p<.001) (Table 5.6). Social and economic rights violations related to livelihood (OR=4.60, p<.001) and forced labor (OR=2.08, p<.01) as well as food (OR=2.33, p<.001) were also strongly associated with self-reported morbidity. Those who were engaged in black market works were more

likely to report morbidity, but other economic and political factors were not statistically associated with self-reported morbidity (Table 5.5).

In regard to access to health service, political and civil rights violations had statistically significant associations with poor healthcare access, especially across discrimination (OR=0.61, p<.05), restriction of movement and residence (OR=0.46, p<.01), and arbitrary arrest, disappearance and detention (OR=0.39, p<.001). Not surprisingly, those who exposed to rights violations of livelihood (OR=0.34, p<.001) and forced labor (OR=0.46, p<.01), and suffered from food insecurity (OR=0.24, p<.001) were less likely to access healthcare service. In addition, lower household wealth (5^{th} vs 1^{st} quintile, OR=0.18, p<.001) and income (<USD1/day, OR=0.20, p<.001) and black market works (OR=0.24, p<.001) were significantly associated with decreased odds of access to adequate health service in most recent illness episode in North Korea. A membership of Worker's Party of Korea (OR=2.48, p<.001) were associated with better access to healthcare service. Meanwhile, there were no statistical differences inmorbidity and healthcare access between the core and hostile class in *Songbun* and between Pyoungyang and other provinces.

Multivariate logistic regression in the adjustment of gender, age, education, a region of origins, and type of migration also confirmed health disparities in morbidity and healthcare access in North Korea (Table 5.7). Respondents with more exposures to political and civil rights violations (10-19 items) presented increased odds of self-reported morbidity (Adj.OR=8.88, p<.001), and decreased odds of access to healthcare service in North Korea (Adj.OR=0.20, p<.01) that those who were not exposed. Lower

household wealth (Adj.OR=0.29, p<.01) was strongly associated with poor healthcare access, while Worker's Party of Korea membership (Adj.OR=3.07, p<.001) were associated with better healthcare access. Those who were engaged in black market works were more likely to report morbidity (Adj.OR=2.28, p<.001) and less to healthcare access (Adj.OR=0.30, p<.001).

Figure 5.1 shows patterns of self-reported morbidity and health care access in North Korea, separating socioeconomic position and human rights situations prior to displacement. A social gradient was found across household wealth, food security, and exposure to political and civil rights and rights related to livelihood and forced labor (Figure 5.1). Participants who reported a lower economic status, food insecurity, and exposure to more human rights violations presented more illnesses and poorer healthcare access in North Korea.

5.4 Discussion

The socialist health system had provided universal health care through an extensive network of human resource and health facilities in North Korea,[9-11] but was supposed to be scaled back under a chronic funding shortage coupled with an international sanction in last decades. Since the great famines in the 1990s, the socialist health system has been dysfunctional from Northern provinces where were politically marginalized from Pyongyang,[21, 22] and provided insufficient health service in discriminative manners. International sanction aggravated health system failure through several mechanisms related to economic crisis and political isolation that have caused a chronic shortage of

essential medicines and medical supplies, aggravation of health financing, and lack of knowledge exchanges in medicine. This study provides retrospective evidence of recent health system transition and patterns of health service utilization in largely unregulated health markets in North Korea

The study results indicated that the informal heath market was widely expanded with an emerging market mechanism. The universal health care still partially operated in the essential programs such as vaccine or delivery,[28, 31] but in reality, we found the private health expenditures were common. The shift from the socialist health system was dominant in medicine and medical supplies. Most respondents purchased medications and medical supplies from informal pharmacies or street stalls in local markets while only 10.0% could receive them from a hospital or clinic. The unregulated pharmaceutical distribution resulted in high utilization of narcotic analgesics and methamphetamine. Half of the respondents reported having taken narcotic analgesics as self-medication, and 39.1% had taken narcotic analgesics even after medical consultation. 2.3% had taken methamphetamines for their most recent illness.

Significantly, our retrospective data of healthcare utilizations shows inadequate access to essential health service in the current health system. Of the 62.9% of respondents who had an illness within one year before displacement, only 37.7% could access to health services mainly because of new health service barriers such as informal payments or bribe, as well as remaining old barriers such as a lack of medications and medical supplies, a lack of trust with the health professional, closed health facilities, or physical distance to the clinic. This rate of health care access is lower than in other former socialist

countries such as Georgia, Azerbaijan, Belarus, Ukraine, Kazakhstan, Moldova, Armenia, and Russia, where almost 50% of patients could seek care, [23] and substantially lower than observations made by the North Korean government and international organizations in North Korea. [28, 31]

The study found complex health disparities across changing political and economic inequities in the unstable market transition, while we found no significant regional difference between Pyoungyang and other provinces and between urban and rural area. The health disparities are in line with privatization and unemployment in the early transition of former socialist countries that were imposed by international actors,[24, 25] but more severely distorted by systematic and widespread human rights violations in North Korea.

First, lower household wealth and income were statistically associated with poor healthcare access, and interestingly human rights violations related to livelihood and forced labor were significantly associated with morbidity and poor healthcare access. Of the respondents in our study, medical costs were reported as a primary reason for not seeking care when needed. The most significant resource for paying medical costs was income from market business (46.8%), while only 7.2% cited incomes from the public distribution system as a resource for medical costs. Despite its critical function in livelihood, local markets were regularly cracked down on for political purposes to stabilize regimes in social changes, and market business was often criminalized while forced labors were still common. Given recent the market transition of the social system, human rights violations related to economic activities could be one of the significant

reasons to aggravate the ability to pay for health services or medication in the informal market. Black market works were strongly associated with increased odds of morbidity and decreased of healthcare access.

Second, political capital element especially a membership of Worker's Party Korea (WPK) were associated with better access to healthcare service, and significantly political and civil rights violations were associated with more morbidity and poor healthcare access. Although the traditional classification of political status, *Songbun*, was blurred in the recent transformative social changes, those who had a family member with a WPK membership had still better access to the socialist health system. A wide range of rights violations such as discrimination, restriction of movement and residence, and arbitrary arrest, disappearance, and detention could directly aggravate one's health condition and access to both formal and informal health system. Furthermore, we supposed that exposures to political and civil rights violations could reflect one's political capital. Political capital provides easy access to socioeconomic resources, influence, and peer supports, all of which could affect health and healthcare access.

Similar to many informal health markets in Asia and Africa,[26] the rapid expansion of informal economic mechanism made health service and medicines available in most marginalize area, but distorted socialist health system and aggravated economic disparities in health. Furthermore, the compositional effects of totalitarian political system are still broad and vigorous in health disparities due to the various types of human rights violations and discriminative policies that remain in the public distribution system and newly emerging health market. Nonetheless, the health system failure was not

properly addressed by international actors working in North Korea,[9, 14] and health reform was significantly suspended due to domestic politics to sustain socialist agenda in health. Health disparities were rarely addressed in national census data and recent population-based assessments jointly conducted by the North Korean government and international agencies.[10, 11, 13] As the study finding indicated, a health system reform is highly required with new financing scheme and should address political and economic determinants of health in more equitable manners. Efforts aimed at reducing health disparities are critical in further humanitarian and development programs in North Korea.

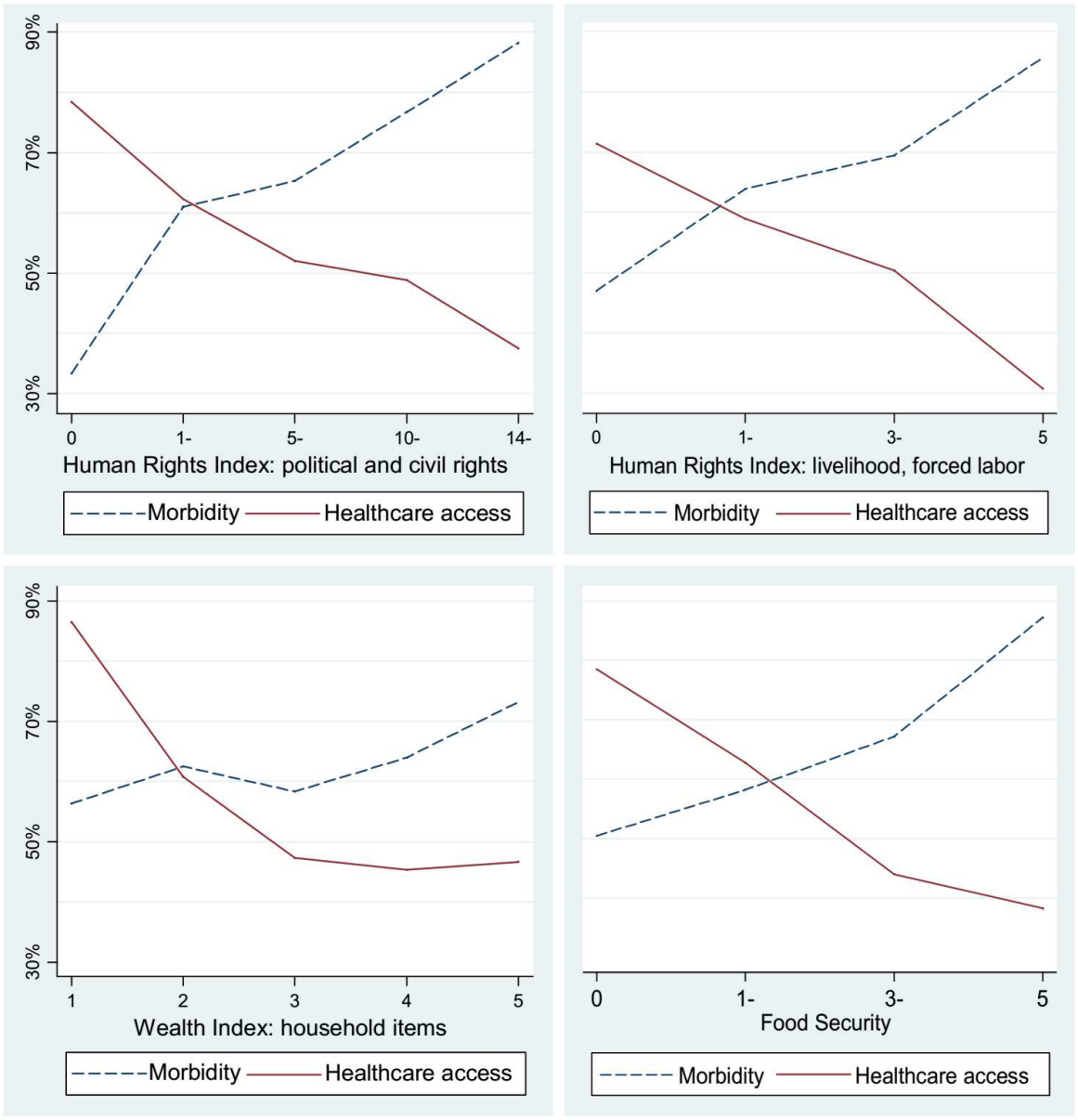
Limitations

Due to the political inaccessibility of North Korea over the last 20 years, this study adopted an indirect sampling approach, focused on North Korean refugees and migrants outside North Korea, and used respondent-driven sampling methods given hard to reach nature of this population. Under safe circumstances outside North Korea, North Korean refugees and migrants provided numerous and detailed accounts of health service utilizations prior to displacement. Although it was the most feasible alternative to investigating abuses in North Korea, however, caution should be taken in generalizing these results. First, survival bias is significant in a retrospective study of the refugee population, which could have resulted in under-representation of those who were exposed to more severe human rights abuses in North Korea. Second, RDS is not a random sample fully representative of the refugee population, and limitations inherent in RDS methods all apply to this study.[27-29]; Third, temporality between some key variables was not established in the cross-sectional design. Lastly, long-term recall period may create a bias.

5.5 Conclusion

The socialist health system was scaled back under international sanctions, leaving informal market mechanisms to fill the gap. Health disparities emerged changing political and economic inequalities and accentuating human rights violations in North Korea. Health system reform, with a new financing scheme, is necessary. The North Korean government and international organizations should work to reduce health disparities in this transitioning health system.

Figure 5.1 Self-reported morbidity and healthcare access with economic, food, and human rights status



*Self-reported morbidity: having illness during one year before displacement;
**Healthcare access: received health service last time medical attention was needed

Table 5.1 Political status, socioeconomic position, and demographic characteristics of respondents

	Crude	RDS adjusted	Homophily
	Freq (%)	% [95% CI]	
Political Status: Songbun			
Very Good (Core class)	69 (18.7)	19.1 [14.8,24.5]	0.1
Good	88 (23.8)	23.1 [17.1,28.6]	0.128
Average (Basic class)	129 (34.9)	38.8 [33.1,46.8]	0.077
Bad	56 (15.1)	13.6 [9.6,16.8]	0.016
Very Bad (Hostile class)	28 (7.6)	5.4 [2.9,7]	0.061
Worker's Party Korea Membership (Individual)			
Non-member	246 (68.52)	69 [62.2,74.9]	0.147
Member	113 (31.48)	31 [25.1,37.8]	0.145
Worker's Party Korea Membership (Household)			
Non-member	117 (32.23)	32.7 [26.6,37.7]	0.031
Member	246 (67.77)	67.3 [62.3,73.4]	0.043
Household Income (Per day)			
< USD1/day	197 (61.6)	64 [57.3,70.9]	0.038
> USD1/day	123 (38.4)	36 [29.1,42.7]	0.073
Market Activity			
Non-engaged	132 (37.93)	37.9 [31.7,45.5]	0.179
Engaged	216 (62.07)	62.1 [54.5,68.3]	0.166
Remittance			
Not Received	127 (37.3)	39 [31.1,44.8]	0.164
Received	216 (63.0)	61 [55.2,68.9]	0.175
Gender			
Female	268 (71.9)	67.4 [61.1,73.2]	0.217
Male	105 (28.2)	32.6 [26.8,38.9]	0.11
Age			
18-35 yrs	101 (27.5)	29.8 [24.0,37.0]	0.134
35-59 yrs	197 (53.7)	51.3 [44.0,57.3]	0.148
60 yrs or Above	69 (18.8)	18.9 [13.8,24.4]	0.111
Education			
Primary School or Lower	9 (2.5)	2.1 [0.8,4.1]	-1
Middle/High School	214 (58.2)	61.6 [54.9,66.8]	0.057
College (Tech)	77 (20.9)	19.9 [15.1,24.6]	0.107
University or Higher	68 (18.5)	16.4 [12.8,22.2]	0.083
Residence			
Rural	91 (25.9)	25.2 [19,31.5]	0.175
Urban	261 (74.2)	74.8 [68.5,81]	0.106
Marriage			
Married	62 (17)	14.3 [9.9,18.5]	0.075
Widowed	42 (11.5)	10.7 [7.2,14.9]	0.118
Divorced / Separated	90 (24.7)	27.2 [22,33.9]	0.121
Never	27 (7.4)	7.4 [4.4,10.8]	-0.153
Partner in North Korea	144 (39.5)	39.2 [33.1,44.9]	0.062
Types of Migration*			
Forced Migration	105(28.2)	26.2 [21.3,31.5]	0.022
Voluntary Migration	268 (71.9)	73.8 [68.5,78.7]	0.096

*Forced migration includes those who were displaced due to political persecution, punishment, and discrimination; voluntary migration includes those who migrated for economic reasons and family invitation, without reason of forced migration.

Table 5.2 Self-reported morbidity and healthcare access

	Crude	RDS adjusted
	Freq (%) [95% CI]	% [95% CI]
Self-reported morbidity		
Illness within 1 year before displacement	227 (62.9) [57.8, 67.7]	62.4 [55.9,68.7]
(Received health care)	71 (37.2) [30.6, 44.3]	34.7 [24.1,44.1]
Healthcare access		
Received adequate healthcare last time medical attention was needed	206 (57.7) [52.5, 62.8]	55.1 [47.7,63.7]
(Public sector) Received any free healthcare services	149 (43.7) [38.5, 49]	37.8 [30.6,45.6]
(Public sector) Bribed to receive healthcare services	116 (33.8) [29, 39]	31.9 [25.5,38.9]

Table 5.3 Experience of accessing health services in North Korea (5 years prior to displacement)

Accessed to health services	Crude	RDS adjusted
	Freq (%) [95% CI]	% [95% CI]
Reason for healthcare seeking		
Certain infectious diseases (TB, typhoid, hepatitis)	29 (9.2) [6.1, 13.8]	8.8 [5.1,12.3]
Respiratory problem: mild* (flu, common cold)	74 (26.3) [21, 32.5]	28.1 [20.8,34.9]
severe**(pneumonia)	10 (3.9) [2.1, 7.4]	3.4 [1.1,6.1]
Gastrointestinal problem: mild (diarrhea, gastritis)	44 (14.9) [10.8, 20.2]	16.8 [11.7,23.6]
severe (appendicitis)	30 (10.5) [7.1, 15.3]	11.6 [6.4,15.4]
Circulatory problem: mild (hypertension)	6 (3.1) [1.5, 6.3]	1.4 [0,3.9]
severe (heart disease, stroke)	14 (5.7) [3.3, 9.6]	4.9 [1.7,8.9]
Muscular skeletal problem (arthritis, back pain)	11 (4.4) [2.4, 8]	3.1 [1.2,6.1]
Genitourinary problem	10 (3.5) [1.8, 6.9]	2.2 [0.3,4.6]
Injury	30 (10.1) [6.8, 14.8]	12.8 [8,19.3]
Headache	8 (2.6) [1.2, 5.8]	1.9 [0.3,4.2]
Other	20 (5.7) [3.3, 9.6]	4.9 [2.4,8.3]
Types of illness		
Communicable disease	124 (44.3) [37.9, 50.9]	47.7 [39.3,53.8]
Non-communicable disease	127 (44.7) [38.4, 51.3]	38.9 [32.2,47.4]
Injury	30 (10.1) [6.8, 14.8]	12.7 [8,18.5]
Others or unspecified	4 (0.9) [0.2, 3.5]	0.7 [0,1.7]
Types of healthcare utilization, by service		
Hospitalization	101 (35.6) [30.2, 41.3]	37.6 [28.9,44]
Outpatient	145 (51.1) [45.2, 56.9]	49.6 [43.7,58.4]
Traditional medicine	38 (13.4) [9.9, 17.9]	12.7 [8.2,17.8]
Types of healthcare utilization, by facilities		
Community doctor (*hodamdang*)	15 (5) [3, 8.1]	5.8 [2.6,9.6]
Village clinic	44 (14.6) [11, 19.1]	14.1 [9.7,19.5]
Hospital (city or county)	154 (51.2) [45.5, 56.8]	53.1 [46.6,59.6]
Hospital (provincial)	48 (15.9) [12.2, 20.6]	15 [9.8,20]
House call	14 (4.7) [2.8, 7.7]	4.3 [1.8,7.8]
Special hospital (TB or maternity hospital)	5 (1.7) [0.7, 3.9]	1.9 [0.3,3.6]
Other health facilities	21 (7) [4.6, 10.5]	5.8 [2.7,8.9]
Medical costs		
Diagnosis (or other medical consultation)	186 (62.6) [56.9, 68]	65.4 [58,74.1]
Medication and medical supplies	228 (79.4) [74.3, 83.8]	82 [75.5,88.1]
Other cost (e.g., meals or heating)	162 (72.6) [66.4, 78.1]	75.9 [65.7,84.1]
Bribe	152 (56.7) [50.7, 62.6]	57.8 [49.2,66.4]
Resource for payment		
Market business	124 (46.8) [40.8, 52.9]	47.3 [40.4,55.3]
Public distribution system	19 (7.2) [4.6, 11]	7.1 [3.5,11.5]
Sale of household items	89 (33.6) [28.1, 39.5]	39.8 [30.9,47.3]
Borrowed	38 (14.3) [10.6, 19.1]	17 [10.4,23.3]
Support of relatives or neighbors	57 (21.5) [16.9, 26.9]	19.4 [13.1,26.3]
Others	14 (5.3) [3.1, 8.7]	4.8 [1.6,8.3]
Location of the purchase of medication and medical supplies		
Informal market (pharmacy)	179 (59.1) [53.4, 64.5]	60.5 [53.2,66.9]
Informal market (street stalls)	125 (41.3) [35.8, 46.9]	42.5 [35.8,49.9]
Hospital/clinic	39 (12.9) [9.5, 17.2]	10 [6.8,15.1]
Others	5 (1.7) [0.7, 4]	2.3 [0,7.9]
Type of medication		
Formal medications (NSAIDs, antibiotics, anti-TB drug)	236 (77.6) [72.6, 82]	79.5 [73.2,84.6]
Herbal medicines	44 (14.5) [10.9, 18.9]	14.9 [10.6,20.8]
Narcotic analgesics (*Jiantongpian*)	119 (39.1) [33.8, 44.8]	39.7 [32.5,49.3]
Methamphetamines	7 (2.3) [1.1, 4.8]	1.8 [0.4,4.1]
Others	33 (10.9) [7.8, 14.9]	8.3 [4.4,12.3]

*condition required out-patient care

**condition required in-patient care, careful out-patient care, or surgery

Table 5.4 Experience of not accessing health services in North Korea (5 years prior to displacement)

Not accessed to health services	Crude	RDS adjusted
	Freq (%) [95% CI]	% [95% CI]
Reason for healthcare seeking		
Certain infectious disease (TB, typhoid, hepatitis)	15 (5.3) [3, 9.1]	6.4 [2.8,9.5]
Respiratory problem: mild* (flu, common cold)	119 (45.6) [39.2, 52.2]	49.2[41.6,56.6]
severe**(pneumonia)	6 (2.2) [0.9, 5.2]	1.9 [0,4.2]
Gastrointestinal problem: mild (diarrhea, gastritis)	59 (23.2) [18.2, 29.2]	23.1[17.2,30.6]
severe	2 (0.9) [0.2, 3.5]	0.2 [0,1.2]
Circulatory problem: mild (hypertension)	2 (0.9) [0.2, 3.5]	0.6 [0,2.2]
severe (heart disease, stroke)	7 (3.1) [1.5, 6.3]	2.4 [0.2,4.5]
Muscular skeletal problem (arthritis, back pain)	13 (4.8) [2.7, 8.5]	4.9 [1.6,9.5]
Genitourinary problem	4 (1.3) [0.4, 4]	1 [0,3.2]
Injury	11 (4.4) [2.4, 8]	2.6 [0.7,4.4]
Headache	10 (4.4) [2.4, 8]	3.3 [1,5.5]
Other	14 (3.9) [2.1, 7.4]	4.3 [1.9,8.2]
Types of illness		
Communicable diseases	173 (66.7) [60.2, 72.5]	71.9[64.2,78.9]
Non-communicable diseases	57 (20.6) [15.8, 26.4]	19.5[13.5,26.9]
Injuries	11 (4.4) [2.4, 8]	2.6 [0.8,4.9]
Others or unspecified	21 (8.3) [5.4, 12.7]	6 [2.6,9.7]
Types of healthcare services not received		
No diagnosis and treatment	86 (28.7) [23.8, 34.1]	30.1 [23.7,36]
Self-medication without diagnosis	148 (49.3) [43.7, 55]	52.1 [44.9,58.2]
Diagnosis without treatment	60 (20) [15.8, 24.9]	18.2 [13.9,24]
Other	19 (6.3) [4.19.7]	5.8 [2.7,11]
Reason for not receiving care		
Medical costs	145 (49.2) [43.5, 54.9]	53.8 [45.1,60.8]
Lack of medication and medical supplies	118 (40) [34.5, 45.7]	39.5 [33.3,47.1]
Closed clinic and hospital	28 (9.5) [6.6, 13.4]	10.9 [5.7,16.1]
No trust in health professional	28 (9.5) [6.6,13.4]	10 [6.5,15.5]
Physical distance to clinic	25 (8.5) [5.8, 12.3]	7.7 [4.3,12.9]
No permission for healthcare	12 (4.1) [2.3, 7]	3.8 [1.2,6.9]
Waiting time	8 (2.7) [1.4, 5.3]	3.2 [1,6]
Other	12 (4.1) [2.3, 7]	2.2 [0.4,3.3]
Source of self-treatment		
No treatment	34 (11.2) [8.115.3]	10.1 [6.3,13.4]
Informal market (pharmacy)	148 (49) [43.4, 54.7]	55.4 [48.4,62.9]
Informal market (street stalls)	122 (40.4) [35, 46.1]	40.8 [34.1,49.3]
Remaining medications	29 (9.6) [6.7, 13.5]	7.7 [4.2,11.4]
Other person's medications	8 (2.6) [1.3, 5.2]	3 [0.7,6.3]
Traditional medicine	43 (14.2) [10.7, 18.7]	10.6 [6.7,15]
Others	10 (3.3) [1.8, 6]	1.4 [0,3.3]
Type of self-medication		
Formal medications (NSAIDs, antibiotics, anti-TB drug)	184 (63) [57.3, 68.4]	63.5 [57.1,71]
Herbal medicine	38 (13) [9.6, 17.4]	11.8 [8,17.8]
Narcotic analgesics (*Jiantongpian*)	163 (55.8) [50, 61.5]	53.7 [45.7,61.2]
Methamphetamines	7 (2.4) [1.1, 5]	2.7 [0.3,6.2]
Others	21 (7.2) [4.710.8]	6.2 [3.2,10.1]

*condition required out-patient care

**condition required in-patient care, careful out-patient, or care surgery

Table 5.5 Bivariate logistic regression: political, economic and demographic factors associated with self-reported morbidity and healthcare access

		Morbidity	Health services access
		OR 95%CI	OR 95%CI
Political characteristics			
Political status, Songbun (hostile vs. core class)		1.36 [0.49,3.78]	0.46 [0.16,1.31]
Workers' Party of Korea member, household		0.82 [0.51,1.32]	2.48*** [1.56,3.96]
Economic characteristics			
Household wealth (5^{th} vs 1^{st} quintile)		1.40 [0.40,4.96]	0.18*** [0.08,0.39]
Household income (very bad vs very good)		0.91 [0.23,3.63]	0.22 [0.04,1.38]
Poverty (house income below US$1/day)		1.37 [0.85,2.18]	0.20*** [0.12,0.34]
Engaged in market activity		2.61*** [1.65,4.14]	0.24*** [0.15,0.40]
Demographic characteristics			
Gender (male vs female)		0.73 [0.46,1.16]	1.64* [1.03,2.60]
Age	18-35 yrs	1 [Reference]	1 [Reference]
	35-59 yrs	2.76*** [1.69,4.49]	0.56* [0.34,0.92]
	60 yrs or above	4.33*** [2.18,8.59]	0.59 [0.32,1.10]
Education	Primary school or lower	1 [Reference]	1 [Reference]
	Middle/high School	0.16 [0.02,1.59]	3.01 [0.67,13.41]
	College (tech)	0.22 [0.02,2.22]	2.79 [0.59,13.12]
	University or higher	0.15 [0.01,1.51]	4.65 [0.97,22.35]
Residence	(urban vs rural)	1.05 [0.63,1.78]	1.03 [0.62,1.73]
	Pyongyang	1 [Reference]	1 [Reference]
	Northern province	0.91 [0.30,2.70]	1.17 [0.43,3.18]
	Eastern province	0.54 [0.16,1.88]	0.69 [0.21,2.26]
	Western province	1.04 [0.28,3.96]	1.76 [0.49,6.25]
Type of migration (forced vs voluntary)		1.29 [0.78,2.13]	1.25 [0.76,2.04]

*p<0.05; **p<0.01; ***p<0.001

Table 5.6 Bivariate logistic regression: human rights violations associated with self-reported morbidity and healthcare access

	Morbidity	Healthcare access
Political and civil rights	OR [95% CI]	OR [95% CI]
Torture and inhuman treatment	1.14 [0.71,1.82]	1.06 [0.67,1.68]
Tortured	1.7 [0.98,2.94]	0.7 [0.42,1.17]
Physical violence by police/security agency	1.06 [0.65,1.72]	1.25 [0.77,2.01]
Discrimination	1.90** [1.23,2.94]	0.61* [0.40,0.94]
Political status based	1.67* [1.04,2.68]	0.57* [0.36,0.90]
Gender based	1.19 [0.72,1.96]	0.49** [0.30,0.81]
Stigma, unspecified	2.92** [1.49,5.74]	0.91 [0.52,1.60]
Freedom of movement and residence	3.18*** [1.96,5.17]	0.46** [0.28,0.76]
Travel	2.62*** [1.67,4.11]	0.48** [0.31,0.76]
Residence	2.73*** [1.75,4.26]	0.49** [0.32,0.75]
Banishment	2.01* [1.11,3.65]	0.58* [0.34,0.99]
Family separation	1.99** [1.21,3.27]	0.86 [0.54,1.37]
Freedom of thought, expression and religion	1.88** [1.20,2.94]	0.8 [0.52,1.25]
Surveillance	1.25 [0.81,1.92]	1.26 [0.82,1.92]
Religious persecution	1.97 [0.43,8.92]	0.36 [0.09,1.45]
Persecution (political opinion)	1.97* [1.06,3.68]	0.64 [0.37,1.12]
Persecution (suspicion of loyalty)	2.53** [1.41,4.51]	0.57* [0.34,0.95]
Persecution (political misconduct of family)	1.4 [0.76,2.60]	0.81 [0.45,1.45]
Being target of ideological attracts	2.67*** [1.54,4.64]	0.59* [0.37,0.96]
Arbitrary arrest, disappearance, and detention	2.47*** [1.59,3.84]	0.39*** [0.25,0.61]
Imprisonment without legal procedure	1.81* [1.08,3.03]	0.82 [0.51,1.32]
Disappearance of family member	2.64** [1.41,4.96]	0.46** [0.26,0.79]
Death of family member in detention	1.68 [0.99,2.86]	0.59* [0.36,0.96]
Public execution (eyewitness)	2.59*** [1.63,4.10]	0.47*** [0.31,0.73]
Total Exposure 0 items	1 [Reference]	1 [Reference]
1-9 items	2.77** [1.33,5.77]	0.46 [0.21,1.01]
10-19 items	5.36*** [2.12,13.53]	0.28** [0.11,0.70]
Social and economic rights		
Rights to livelihood	4.60*** [2.89,7.32]	0.34*** [0.22,0.52]
Means of livelihood threatened by state actor	5.22*** [3.21,8.48]	0.37*** [0.24,0.58]
No access to legitimate means of livelihood	2.09* [1.16,3.77]	0.44** [0.26,0.76]
Forced Labor	2.08** [1.30,3.32]	0.46** [0.29,0.75]
Involuntary work for WPK or army	2.05** [1.32,3.18]	0.8 [0.52,1.22]
Involuntary work in detention	1.27 [0.77,2.10]	0.75 [0.46,1.21]
Involuntary work without compensation	1.72* [1.10,2.69]	0.62* [0.39,0.96]
Subtotal Exposure 0 items	1 [Reference]	1 [Reference]
1-2 items	2.39** [1.36,4.19]	0.53* [0.29,0.84]
3-5 items	3.81*** [2.15,6.77]	0.38*** [0.22,0.68]
Rights to food (Food Security)	2.33*** [1.47,3.69]	0.24*** [0.14,0.40]
Household Hunger Scale (FANTA2,3 items)	1.11 [0.61,2.03]	0.32** [0.16,0.64]
Life threatening starvation (respondent)	2.71*** [1.70,4.31]	0.21*** [0.13,0.33]
Life threatening starvation (family member)	3.39*** [1.76,6.52]	0.63 [0.37,1.06]
Subtotal Exposure 0 items	1 [Reference]	1 [Reference]
1-2 items	1.38 [0.77,2.46]	0.44* [0.23,0.83]
3-5 items	3.11*** [1.87,5.18]	0.18*** [0.10,0.31]

Table 5.7 Multivariate logistic regression: factors associated with self-reported morbidity and healthcare access

	Morbidity		Healthcare access	
	AOR	95%CI	AOR	95%CI
Political and civil rights violation				
0 items	1	[Reference]	1	[Reference]
1- 9 items	5.23**	[1.94,14.06]	0.38	[0.14,1.03]
10-19 items	8.88***	[2.56,30.82]	0.20**	[0.06,0.66]
Political and economic characteristics				
Songbun (hostile vs. core class)	0.45	[0.12,1.68]	1	[0.27,3.79]
Workers' Party of Korea member	0.59	[0.31,1.12]	3.07***	[1.65,5.72]
Household Wealth (5^{th} vs 1^{st} quintile)	0.84	[0.34,2.09]	0.29**	[0.11,0.74]
Engaged in market activity	2.28**	[1.27,4.08]	0.30***	[0.16,0.55]
Demographic characteristics				
Gender (male vs female)	0.79	[0.42,1.46]	1.46	[0.79,2.72]
Age 18-35yrs	1	[Reference]	1	[Reference]
35-59yrs.	3.48***	[1.89,6.40]	0.54*	[0.29,1.00]
60yrs or above	5.81***	[2.37,14.28]	0.85	[0.37,1.95]
Residence (urban vs rural)	0.91	[0.46,1.78]	0.86	[0.45,1.66]
Type of migration (forced vs voluntary)	1.54	[0.78,3.06]	1.32	[0.68,2.56]

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6 Discussion

6.1 Study limitations

Given political barriers to access to the North Korean population, we adopted a retrospective study of outmigration flow as an alternative method to obtain data in situations where the population of interest is inaccessible. This retrospective study design may be limited in its capacity to generalize to the entire population of North Korea, even if the RDS method managed to capture a representative sample of the North Korean refugee population in South Korea. This study is subject to a number of limitations:

- The distribution of human rights violations especially related to freedom of movement and other political and socioeconomic variables are likely different in North Korea overall compared to what was indicated in our findings. North Korean refugees disproportionally come from *North* and *South Hamkyoung* province near the North Korean border. Also, there might be considerable difference of personal experience between North Korean refugees and general population even in the same province in North Korea.
- Survival bias is a significant concern in refugee populations. Regarding human rights experience, victims of the most severe human rights violation such as those who suffer in fully controlled political prisons are extremely unlikely to be able to flee from North Korea. Similarly, households that have a family member under police control have difficulties in movement as well. Also, any deaths related to severe human rights abuses would not be accounted for refugee samples. These factors could have resulted in under-representation of North Koreans with more severe human rights abuses.

- Likewise, those who are severely ill or those who have mental health problems or poor social functioning may be less likely to escape North Korea. There are substantial border controls between North Korea and Chinese border. Also, migration and smuggling routes in China and Southeast Asia are dangerous and not easy for physically and mentally vulnerable persons. This could lead under-representation individuals those who have poor health status especially in our results relating to mental health outcomes.

Nonetheless, in a reclusive state like North Korea, this indirect, retrospective study based on recent migrant and refugee outflows can help us understand trends and patterns of human rights and the public health situation in North Korea, where the nationally representative, randomized surveys are nearly impossible. In a similar manner, Robinson provided scientific evidence of elevated household mortality and declining fertility during the "Great Famine" period 1995-1998 through a retrospective study of North Korean refugees displaced from North Korea.[1] Also in another difficult to access context like Iraq, a retrospective study of Iraqi refugee doctors in Jordan used an alternative method to investigate the impact of conflict on health system.[2]

Potentially confounding factors related to forced migration such as traumatic experience as a refugee and social determinants of health in resettlement were carefully identified and adjusted for in our data analyses. Also, the political and socioeconomic status of respondents systemically collected through a cross-sectional survey were adjusted in order to measure the association between human rights variables and other variables of interest. Descriptive analyses showed a relatively proportional distribution of political

and socioeconomic variables without considerable deviations. In multivariate analysis, key variables of interests were not statistically associated with reasons of displacement that were potentially related to migration bias. Therefore, the descriptive results reported in this study might not be fully generalizable, but it may offer insights into the magnitude of human rights violations in the North Korean population at large. Interpretive analyses can help us to understand patterns and consequence of human rights violations on North Koreans' lives. But again, the indirect methods based on outmigration flow are alternatively justified given the extremely inaccessible context where direct estimation is not possible inside the country.

In addition, following methodological limitations should be taken in interpreting the study findings.

- First, Respondent Driven Sampling (RDS) has been recommended for its strengths in measuring hidden or hard to reach populations, but this study still is not a population-based random sample. Nonetheless, it is the most feasible alternative to investigate the North Korean refugee population for which a random sample is nearly impossible, and one of the very few studies that have accessed this population in probability sampling manner. Most quantitative studies on the North Korean refugee population have been based on convenience samplings such as simple snowball sampling or facility-based sampling or do not have sampling framework.
- Second, some items in the human rights violation inventory are related to other outcome variables or one more form of human rights violence due to the interdependence of human rights. This may cause a bias towards the null for the

association presented in some hypotheses. As noted earlier, these items were not included in examining certain hypothesis- for example between rights to health and health service utilization.

- Third, cross-cultural differences can affect mental health symptoms and cut-off scores relevant to for diagnosis presented in this study. The Harvard Trauma Questionnaire (HTQ) and Hopkins Symptom Checklist (HSCL) have been used and validated in various contexts of political violence, conflict, and forced migration, but were not specifically validated in the North Korean refugee population. Mental health outcome derived from the HTQ and the HSCL have not yet been compared with structured clinical interviews in North Korea population.
- Fourth, temporality between some variables was not established in this cross-sectional study; thus, for example, some variables in healthcare utilization may precede some of the human rights violence experience reported by study participants.
- Lastly, the recall period in this study may create a bias towards the null for the associations presented. However, despite the long-term recall period (10 years), we found respondents had little difficulty in answering items in the human rights violation inventory, maybe due to the intensity of traumatic memories. Some literature indicates high test-retest reliability in reports of traumatic exposure even with long-term recall period.[3] But this may lead potential differential misclassification of variables like depression and PTSD, which are potentially related to cognitive function and memory (although this is a common limitation

in observational trauma studies that use self-reported measures).

6.2 Study implications

Providing epidemiological evidence of human rights violations in North Korea: The UN Commission of Inquiry (COI) on Human Rights Violation in Democratic People's Republic of Korea (DPRK) was established in March 2013 to investigate the systematic, widespread and grave violations of human rights.[4] While the testimonial evidence of human rights abuses from UN COI and other human rights actors have gained international attention for continuing pressure on the North Korea government to stop human rights abuses, it still lacks quantitative evidence on the prevalence of human rights violations and its social distribution in North Korea. To date, this research is the first that provides epidemiological evidence of human rights abuses in North Korea that have been evaluated almost entirely in a qualitative manner.

First, this study suggests that the prevalence of each human rights violation is exceptionally high in North Korea, even compared to other authoritarian states.[5, 6] In spite of recent social transformation, the totalitarian nature of political system is still reflected in structural discrimination as well as in an almost complete denial of freedom of thought, expression, and religion, and freedom of movement. Findings suggest the totalitarian system is reinforced and safeguarded by a political and security apparatus that uses the surveillance, torture, public executions, forced disappearance, and arbitrary arrest. Under a malfunctioning public distribution system, the North Korean population severely suffers from a lack of food and essential health services without a lawful means of

livelihood.

Second, the study adds new findings indicating that human rights violations are disproportionally distributed by political, social, and economic inequalities.[7, 8] The post-socialist transition with an informal market economy has created a very unstable social system, perhaps outside of government control.[9-12] Wealth has emerged as new social capital between politically privileged and disadvantaged groups through rapid expansion of the black market. The pattern of human rights violations among individuals is significantly associated with those changing inequalities and power imbalances accessing the political, social, and economic resources necessary to promote human rights or to prevent human rights violations.

From an epidemiological perspective, the study findings help identify who is vulnerable to human rights violations, and which risk factors may be associated these violations. Low economic status is not only associated with household hunger or starvation under informal market mechanism but also is related to increased likelihood of a wide range of political and civil rights violations. Low political status was additionally significantly associated with political persecutions, structural discrimination and rights violations related to forced labor and livelihood. Human rights violations were statistically high among disadvantaged groups who had less political and economic means.

The study comes at an important point in time when the UN Security Council is considering referring the human rights situation in North Korea to the International Criminal Court. The study finding can be used as epidemiologic evidence documenting the breadth of human rights concerns in North Korea, where the gravity, scale, and nature

of these violations are unparalleled in the contemporary world. The study can contribute to both national and international legal proceedings and advocacy for more equitable allocation of socioeconomic resources for most vulnerable groups in North Korea. It is clear that efforts aimed at reducing human rights violations are imperative and their consequences should be addressed for millions of survivors inside North Korea.

Providing new information of health system failure in North Korea: The socialist health system provided universal health care through an extensive network of human resource and health facilities in North Korea,[13, 14 15] but has been scaled back under a chronic funding shortage. As this study indicated, the decentralized and unregulated health markets have widely expanded with an emerging informal market mechanism in last decade. Universal health care still only partially operated in essential programs such as vaccine or delivery[15, 16], at the same time, in reality, we found the private health expenditure such as informal user fees or bribes is common. In addition, the rapid expansion of informal health markets made medicines and medical supplies available in marginalized areas but undesirably resulted in a distorted health system that has resulted in high utilization of narcotic analgesics and methamphetamine as self-medication for illness.

Health disparities newly emerged between disadvantaged and privileged groups in this unstable market.[17] Our retrospective data consistently showed poor access to health care service. Of the 62.9% of respondents who had an illness within one year before displacement, only 37.7% could access health services due to financial barriers to

informal payments, a lack of medicines and medical supplies, a lack of trust of health professionals, closed health facilities, or physical distance to the clinics. This rate of health care access is substantially lower than observations made by the North Korean government and international organizations in North Korea,[15, 16] and lower than that of other former socialist countries such as Georgia, Azerbaijan, Belarus, Ukraine, Kazakhstan, Moldova, Armenia, and Russia, where almost 50% of patients seek care.[18]

Health system failure has coincided with the rapid privatization of health sectors, and unregulated out of pocket expenditures in the early transition of some former socialist countries,[19, 20] but appears to have been more severely aggravated by international and domestic politics around North Korea. International sanctions due to political tensions have the distorted health system through the economic crisis and political isolations that have resulted in shortages of essential medicines and medical supplies, poor health financing, and lack of knowledge exchanges in medicine. The compositional effects of totalitarianism on health system are still broad and vigorous due to the various types of human rights violations and discriminative policies that affect the public distribution system and newly emerging health market.

The health system failure has not been properly addressed by international actors working in North Korea,[15, 16] and health reform has been significantly suspended due to domestic politics with the goal of sustaining socialist agenda in health. Health disparities were have been masked in national census data and recent population-based assessments jointly conducted by the North Korean government and international agencies.[13, 14, 21] As our study finding indicated, a health system reform with a new financing scheme is urgent

and requires more equity for political and economic determinants of health. Efforts aimed at reducing health disparities should be addressed in further humanitarian and development programs in North Korea.

Human rights as political determinants of health: The Committee on Economic, Social, and Cultural Rights (CESCR) General Comment No 14 defined the right to health as the right to access opportunities to enjoy the highest attainable standard of health. The right to health includes not only adequate access to health services; but also means equitable, non-discriminatory access to the underlying determinants of health.[22] The widespread and systematic human rights violations we identified in this study are interdependent, interrelated, and indivisible on the right to health in North Korea. Social and economic rights violation related to livelihood and forced labor are directly associated with economic resources for health and healthcare service.[23] The right to food is the essential right to an adequate nutritional status that is necessary to enjoy health. Political and civil rights are not only critical components necessary for political mobilization to achieve an equitable health system at the population level. Individual exposure to violations of these rights, all of which are addressed in this study, could lead to physical injuries, inadequate sanitation, and unsafe and unhealthy environments as well as disproportionate access to socioeconomic resouces for health.[24, 25]

This study is unique in that we measured a wide range of human rights violations as political determinants of health.[26] The study addressed traditional social determinants of health such as household wealth and income, as well as context-specific determinants

such as a membership of Worker's Party of Korea, which showed significant associations with access to health service in North Korea. Not surprisingly, this study found that wide range of human rights violations was strongly associated with increased morbidity and poor healthcare access. Rights violations related to livelihood or forced labor could aggravate the health of politically disadvantaged groups and their economic capacities to access health service. Political and civil rights violations such as discrimination, restriction of movement and residence, and arbitrary arrest, disappearance, and detention, all of which could aggravate economic resources, influence health and healthcare access.

In addition, major findings of this study suggest that human rights are political determinants of mental health in a population of North Korean refugees in South Korea. In North Korea, systematic and gross human rights violations have been normalized in everyday life,[27] and deeply affected the psychosocial environment of North Koreans through the life course. This study measured a wide range of human rights violations not only as potentially traumatic events or injuries,[28, 29] but as long-term mental health determinants. Compared to South Koreans,[30] psychiatric symptoms were not only prevalent among North Korean refugees and migrants who experienced traditional traumatic events such as torture, rape, or starvation, but also among those who had suffered from systematic human rights violations related to freedom of movement, freedom of thought and expression, or rights to livelihood. Not surprisingly life-long exposures to political violence and a discriminative social system could have prolonged consequences on the well-being of refugees who are already displaced from those situations.[31] These findings suggest that systematic and widespread human rights violations need to be considered as long-term determinants of mental health in affected

communities.

In the context of forced migration, these findings may challenge the traditional understanding of refugee health that has paid more attention to the traumatic experience of forced migration than to political and social determinants of health that had been embodied prior to displacement. Human rights violations are significant determinants of poor health in certain population, but it is outside usual the scope of psychiatric and social epidemiology literature.[32-35] The finding from this study may expand our view of certain traumatic events to include political determinants of health in the past and present as critical social determinants of health. Policymakers and health professionals need to pay more attention to human rights in regard to health determinants in vulnerable populations and adjust human rights frameworks. Evidence, such as that of our study, helps to identify health risk factors related to human rights abuses at an early stage of displacement or resettlement and maybe help to inform comprehensive medical and psychosocial assistance programs in affected communities.

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APPENDIX

Annex 1. UN COI Findings of human rights violations in North Korea

Table 7.1. Human rights violations in North Korea

Category	*Key Finding*
A. Torture and inhuman treatment	
Interrogation using torture and starvation	a. Systematic and widespread use of torture b. Torture and inhuman treatment by the State Security Department d. Torture and inhumane treatment by the Ministry of People's Security e. Decision to punish through judicial process or extralegal means
Torture in Political Prison Camp and other ordinary prison system	a. Torture and inhuman treatment in Political Prison Camp b. Torture and inhuman treatment in Ordinary Prison Camp (Kyohwaso) c. Torture and inhuman treatment in Short-term forced labour detention camps
B. Discrimination .	
Discrimination based on social class and birth: the Songbun system,	a. Discrimination in residence b. Discrimination in employment c. Discrimination in essential social service including food and food ration d. Discrimination in education e. Discrimination in criminal justice system
Discrimination against women	
Discrimination against persons with disabilities	
C. Violations of the freedom of movement and residence	
Freedom of movement and residence	a. State-assigned place of residence and employment: i. Banishment from Pyongyang ii. Situation of street children b. Liberty of movement within one's country
Right to leave one's own country	a. Total travel ban b. Patterns of flight from the Democratic People's Republic of Korea and underlying reasons c. Border control measures d. Torture, inhuman treatment and imprisonment of persons who tried to flee the Democratic People's Republic of Korea i. Torture and inhuman treatment during interrogation ii. Sexual violence and other humiliating acts against women, in particular invasive searches iii. Conditions at the holding centre (*Jipkyulso*) e. Forced abortion and infanticide against repatriated mothers and their children f. Forced repatriation and *refoulement* of citizens of the Democratic People's Republic of Korea by China i. Trafficking in women and girls
Right to return to one's own country and right to family	
D. Violations of the freedom of thought, expression and religion	
Indoctrination, propaganda and the related role of mass organizations	a. Indoctrination from childhood b. The Mass Games and other compulsory mass propaganda events c. Confession and criticism sessions d. Compulsory membership in mass organizations e. Ubiquity of propaganda
Control of information through tightly controlled State media and prohibition of any external information, including non-political information	a. Control of television and radio b. Control of print media and the Internet, and other means of communication c. Crackdown on foreign movies and mobile telephones
Suppression of freedom of expression and	a. Monitoring and surveillance system

opinion through surveillance and violence	
Denial of freedom of religion and of religious expression	a. Institutionalization of the personality cult b. Religious persecution c. Practising Christianity as a political crime d. Impact of discrimination on economic, social and cultural rights
E. Violations of the right to food and related aspects of the right to life	
Availability, adequacy and affordability of food	
Consequences of geographic segregation and discrimination	
Awareness and concealment	
Actions and omissions of North Korea	a. Reluctance to change b. Preventing and punishing alternative views c. Confiscation and dispossession of food d. Criminalization of coping mechanisms i. Freedom of movement ii. Other coping mechanisms
Obstructing humanitarian assistance and access to the most vulnerable	
Non-utilization of maximum available resources	a. Prioritization of military expenditure b. Use of aid to reduce State spending on food c. Role of bilateral donors d. Parallel funds for the benefit of the Supreme Leader e. Advancement of the personality cult and glorification of the political system f. Purchase of luxury goods
Violation of freedom from hunger, death by starvation and diseases related to starvation	
Violation of the right to food and prisoners	
F. Arbitrary arrest, detention, executions and enforced disappearance	
Arbitrary arrests and enforced disappearances	a. Arbitrary arrest and detention handled by the State Security Department (SSD) b. Arbitrary arrest and detention handled by the Korean People's Army (KPA) c. Arbitrary arrest and detention handled by Military Security Command
Executions	a. Public executions in central places b. Executions in places of detention c. Crackdown on foreign movies and mobile telephones
Enforced disappearance of persons from other countries, including through abduction	a. Abduction and enforced disappearance of women from South Korea, Japan, China and other countries b. Suffering, discrimination and persecution resulting from disappearances
G. Full range of violations associated with political prison camps and other ordinary prison	
Political prison camps	a. Total control, torture and executions b. Sexual violence and denial of family and reproductive rights c. Starvation, forced labour and diseases d. Deaths in custody and lack of respect for the dignity of the dead
Ordinary prison camp (Kyohwaso)	a. Unfair trials preceding imprisonment b. Inhumane conditions of detention c. Torture and executions d. Rape and forced abortion e. Lack of medical care, deaths in custody and lack of respect for the dead
Short-term forced labour detention camps	a. Labour training camps (*Rodongdanryundae*), established by local authorities

	at the county level b. Labour reform centres (*Kyoyangso*) in provinces and major cities c. The MPS and SSD holding centres (*Jipkyulso*)

Annex 2. Consent form

Consent to Participate in Survey

Title: Mental health and psychosocial consequences of political and human rights violation among North Korean refugees in South Korea

Sponsoring Organizations: The Korea Institute for National Unification (KINU) with technical assistance from theUS Centers for Disease Control and Prevention (CDC)

Introduction and Purpose: We invite you to participate in a survey. This form is designed to tell you everything you need to think about before you decide to consent (agree) to be part of the survey. It is entirely your choice. If you decide to take part, you can change your mind later on and withdraw from the survey. The decision to join or not join the survey will not cause you to lose any benefits or affect you.

We are inviting you to participate in a survey to assess mental Health and psychosocial consequences of political and human rights violation in Korean refugees in South Korea. The data collected in this survey will be used to providere commendations to better support North Korean refugees who are participating in this survey

Full participation will require about one (1) hour of your time.

Procedures:
If you choose to be in the study we will ask you to fill out a questionnaire. This questionnaire will:

- ask about events in North Korea, during your escaping and in China or the 3rd countries that may have been stressful to you
- ask questions about your feelings
- ask questions about events that your family experienced

Risks and Discomforts: We do not expect this assessment to cause any harm to you. There is a possibility that some of the questions will cause uncomfortable emotional feelings. You don't have to answer any questions you don't want to. If you do experience discomfort, and you would like to speak with someone about it, we will provide appropriate referrals.

Benefits: **T**aking part in this research study may not benefit you personally, but the researchers may learn new things that increase understanding of stress in North Korean refugees in South Korea.We will provide recommendations to South Korean government based on the survey results.

Withdrawal/Choosing Not to Participate
You can choose to be in this survey or not. If you decide not to be in the survey, nothing will happen to you. If you join the survey, you do not have to answer any questions you do not want to. You can also choose not to do some parts of the survey.

Compensation
You will be offered a cash of KRW 20,000 for participating in survey and of KRW 80,000 for being interviewed.

Confidentiality
A study number rather than your name will be used on the questionnaires. None of the results will ever be identified by name. Your name and other facts that might point to you will not appear when we present this study or publish its results. We will never provide your employer with information on you, including whether or not you participated in the survey.

Costs:
There are no anticipated costs to you for participating in this assessment.

Questions
Please contact Jaeshin Kim (010-5576-9864, jaeshin1@hanmail.net) or Jiho Cha (010-7768-4037, chajiho@gmail.com) if you have any questions, concerns or complaints about this study or your part in it.

Consent
I have read this form. I have had a chance to ask questions about this survey and my questions have been answered. I have been given a copy of this form to keep.

I agree to take part in filling out the questionnaire: Yes No

_____
Name of Participant

_____ _____
Signature of Participant Date

Please sign both copies, keep one and return one to the survey coordinator.

_____ _____
Signature of Person Conducting Informed Consent Discussion Date

Annex 3. Curriculum Vitae

JIHO CHA, MD PhD

Atlanta, GA., United States P: +1 4432481435 Email: jcha9@jhmi.edu;
Seoul, South Korea P:+82 1077684037 chajiho@gmail.com

EXECUTIVE SUMMARY

Jiho Cha, MD PhD is a physician and public health scholar with12 years' experience in humanitarian operations and human rights researches for refugees and socially marginalized population in North Korea and other Asian countries. Governmental, non-governmental and international organizations he has worked with include Médecins Sans Frontières, International Organization for Migration, Human Rights Watch, Open Society Foundation, Medipeace and South Korean Ministry of Unification. He received his PhD degree in international health at the Johns Hopkins University, medical degree at the Donga University and master degree at the University of Oxford. He is one of founding members of MSF Korea, and appointed as a faculty associate in the Bloomberg School of Public Health, Johns Hopkins University.

EDUCATION

2016 PhD — **Johns Hopkins University, Bloomberg School of Public Health, United States**
PhD, Health System Program, Department of International Health

2010 MSc — **University of Oxford, United Kingdom**
Master of Science in Forced Migration, Refuge Studies Center, Dept. of International Development

2005 MD — **Donga University, College of Medicine, South Korea**
Pre-medicine (1999-2000); Medicine (2001-05)

PROFESSIONAL EXPERIENCE: Academic, Governmental, Non-governmental and International Organizations

2012-Present — **Johns Hopkins Bloomberg School of Public Health.**
Faculty Associate, Department of Health, Behavior and Society

- Principal Investigator of a joint research project between Centers for Disease Control and Prevention (CDC) and Korea Institute of National Unification to measure human rights violations in North Korea and their health consequences, and to develop policy response to traumatized North Korean refugees population in South Korea in 2014-15.
- Co-Investigator of several projects including a human rights based analysis of the status of North Korean children (2015); a study of 'Protection and Monitoring of North Korea Refugee Children in Northeast China (2014); a populations estimate of North Korean refugees and children born to human trafficked North Korean mothers in China (2012/2013)in support of Korea Institute of National Unification and United Nations High Commissioner for Refugees (UNHCR)
- Advising students in the Masters of Science in Public Health program in the Dept. of Health, Behavior and Society, and Master of Public Health program (MPH); and Development of two courses of 'international development in health' and 'disaster response' for health professionals and relevant NGO/GO officials in South Korea with invited lecturers from MSF, MercyCorp, UNHCR, USAID and Academia.

2009-12 **Médecins Sans Frontières**
Medical Consultant, Mission of North Korea, MSF Switzerland (2009-12);
Founding Member, MSF South Korea (2012)

• Principal Investigator of health service research on healthcare access of human trafficked North Korean women and children in China
• Launched and coordinated refugee health program in North Korea border under sensitive and unsafe environment (the first medical program by international actor); and developed implementation and monitoring strategies
• Technical supports to nutrition program inside North Korea and stateless child protection in North Korea border area
• Provided series of technical assistance to executive director for problem solving in barriers of founding process of MSF South Korea.

2009-12 **Medipeace***
Board of Director (2011-12); Expert Advisor (2010-11)
*Medical Humanitarian NGO found in Korea in 2009

• Successfully developed agency to the one of major medical humanitarian NGO in South Korea in 3 years, covering missions in 13 countries, supporting 9 health centers;
• Co-directed and developed for existing program and new initiatives
• Developed new partnership with academia, public donors, and implementing partners, both domestic and international
• Provided technical advice and supervision for programs in China, Korea, Tanzania, Russia, Vietnam, Papua New Guinea;
• Organized capacity building program for governmental/non-governmental actors; and humanitarian advocacy program held in National Assembly

2008 **International Organization for Migration (IOM)**
Project Coordinator

• Conducted counter-trafficking research project funded by US- Bureau of Population, Refugees, and Migration and developed other North Korea related projects
• Advisory service for national assembly and NGOs for the issue of North Korea.

2005-08 **Ministry of Unification, South Korea**
Public Health Physician (Chief Official)

• Provided clinical consultation and screening of around 4,000 North Korean refugees; and supervised medical staffs at the Settlement Support Center for North Korean Refugees;
• Developed and coordinated initial refugee health system with multi-sectorial partners;
• Policy advice and technical assistance to the Ministry of Unification and other regional/national actors;

PROFESSIONAL ACTIVITIES: Consultations/Project based works

Consultancy works

2013 **Open Society Foundation.** Developed strategies based on performance evaluation of key actors on North Korea issues with a specific focus on human rights, health and rights, and information and media; Provided analysis on the situation inside North Korea and in Northeastern China.

2012 **Médecins Sans Frontières, Switzerland.** As initial member of MSF delegation team to Pyongyang, provided analytic report and developed strategies for humanitarian program inside North Korea

2011-12 **Human Rights Watch.** Conducted qualitative researches on human rights violation in North Korea with in-depth interviews of 90 North Korean refugees, and provided series of technical advises to strengthen and cross check HRW's analysis

2011-15 **Korea Institute for National Unification, South Korea.** Conducted researches and provided strategic advising on health situation in North Korea; Organized multiple international seminars and sessions in South Korea, United Kingdom and USA on human rights and humanitarian issues in North Korea and North Korean refugee population

Emergency Relief and Short Operations

2006 **Emergency Relief, Indonesia Earthquake, KEMAT*,** Physician, *Korea Emergency Medical Aid Team (KEMAT) was the project group of medical relief actors under Korean Medical Association. **Emergency relief work, dispatched under the permission of Ministry of Unification

2005 **North Korean -South Korean Family Reunification*, The Red Cross of Korea,** Medical Advisor, *The 10th round of North-South Korean family reunions, organized by Korean Red Cross; ** Officially dispatched from Ministry of Unification

2005 **Emergency Relief, Pakistan Earthquake, KEMAT,** Physician, **Emergency relief work, dispatched under the permission of Ministry of Unification

Research Projects

2016 *Principal Investigator*, Machine learning based health screening model, jointly with Samsung Medical Center, South Korea.

2015 *Co-Investigator*, A Human Rights Based Analysis of the Status of North Korean Children, funded by The Committee for Human Rights in North Korea

2015 *Principal-investigator,* "Integrative investigation of North Korean refugee trauma" joint research by Korea Institute of National Unification Seoul Korea, Korea and Centers for Disease Control and Prevention, Atlanta, United States.

2014 *Co-Investigator*, Protection and Monitoring of North Korea Refugee Children in Northeast China, funded by The United Nations High Commissioner for Refugees (UNHCR)

2013 *Co-investigator,* "Population Study of left-behind children born to North Korean Refugee in two province in Northeast China" funded by Korea Institute of National Unification, Korea and United Nations High Commissioner for Refugees (UNHCR)

2012 *Co-investigator,* "Psychosocial need assessment of Left-behind Korean Chinese Children in Northeast China" funded by Ministry of Administration and Security, Korea

2012 *Co-investigator,* "Population Study of left-behind children born to North Korean Refugee in one province in Northeast China" funded by Korea Institute of National Unification, Korea

2012 *Principal-investigator,* "Human Rights violation in recent social changes in North Korea" Human Rights Watch

2012 *Co-investigator,* "A study for quality evaluation in health system in North Korea" Seoul National University Hospital, funded by Institute for Peace and Unification Studies, Seoul National University

2011 *Principal-investigator*, "Securing humanitarian space: evaluation and access strategies to North Korea, funded Médecins Sans Frontières, Switzerland

2011 *Co-investigator,* "Papua New guinea Rural Health Need Assessment: Baseline Data Survey" funded by Korea International Cooperation Agency (KOICA)

2011 *Co-investigator*, "Humanitarian Aid Policy: a Study of Bilateral Emergency Aid System" funded by Korea International Cooperation Agency (KOICA)

2010 *Principal Investigator,* "Access to healthcare for North Korean refugees in China: field survey and recommendation for health response", funded by Médecins Sans Frontières, Switzerland

2008 *Co-investigator:* "Human Trafficking in displaced North Korean in China". International Organization for Migration (IOM), funded by Bureau of Population, Refugee and Migration (PRM), United States

Program Development I: Humanitarian and International Development Projects

2012 *China* Medical and Psychosocial program for Left-behind Children born to North Korean Women in China* Medipeace, funded by South Korean's Ministry of Administration and Security * Psychosocial TOT program for school teachers, nurses and key government officers, for left-behind children of vulnerable migration.

2011-12 Papua New Guinea Health system strengthening program in Papua New Guinea*, Medipeace, funded USD 5,500,000 by Korea International Cooperation Agency (KOICA) *Strengthening district health system with improvements in human resource, a supply of vital medications and medical equipment, non-food items, water and sanitation and health information system in coordination with WHO, ADB, AusAid JICA and PNG MOH.

2011-12 *China* Medical network for left-behind North Korean Children in China-North Korea border, Medipeace, initially funded and collaborated by Médecins Sans Frontières, Switzerland, China

2009-11 *China* Refugee healthcare program for North Korean refugee in China-North Korea border, Médecins Sans Frontières, Switzerland, China

2009-11` *China* Food support program for North Korean refugee and economically marginalized households in the Chinese Community , Médecins Sans Frontières, Switzerland, China

2009-12 *Russia* Primary heathcare projects for ethnic minority returnees* from forced migration to central Asia under Soviet period: the establishment and coordination regional health center in Primorsky Krai, far eastern Russia, Medipeace, *role of senior supervision with technical assistance;

2009-12` *Vietnam* Vision for Vietnam Dioxin Support Victims Project in Quang Tri province, Vietnam: Rehabilitation programs for disabled children under genetic effects of dioxin - Agent Orange in Vietnam War. , Medipeace, *role of senior supervision with technical assistance

2009-12` *Tanzania* Neonatal infections disease prevention projects in Tanzania: capacity building of medical staffs in Mwananyamala Regional Referral Hospital and community level, with an application of low cost cord clamp device. , Medipeace, *role of senior supervision with technical assistance

Program Development II: Symposium, Advocacy, Capacity Building Program

2014 *Program Organizer,* Scaling up Humanitarian Cooperation in the DPRK (closed conference participated by 40 humanitarian actors including UNICEF, WHO, IFRC, WFP, etc.), co-hosted by Korea Institute for National Unification and London School of Hygiene and Tropical Medicine, London, United Kingdom.

2014 *Program Organizer,* Humanitarian cooperation in DPRK, (closed conference participated by 40 humanitarian actors including UNICEF, WHO, IFRC, WFP, World Bank etc.), co-hosted by Korea Institute for National Unification and Green Templeton College, University of Oxford, Oxford, United Kingdom.

2012 *Program director,* Peace Symposium: Humanitarian View from Peace, organized by UN Peace Day organizing Committee Korea, held in National Assembly, Seoul Korea

2012 *Co-organizer,* Oxford Humanitarian Academy* organized by Wellcome Unit for the History of Medicine, University of Oxford *Short certificate program for under-/post graduate student and relevant actors in humanitarian studies (emphasis on ethical, historical and political understanding on humanitarian acts),

2012 *Co-organizer,* Health and Human Rights in North Korea, organized by Wellcome Unit for the History of Medicine, University of Oxford

2012 *Program director,* International Forum, North Korea: Beyond Human Rights and Humanitarianism, organized by Medipeace in collaboration with Korea Institute of National Unification, Seoul Korea

2012 *Session-organizer,* 'The reality of healthcare in North Korea and How to improve it ', The 2nd KINU Chaillot Human Rights Forum: International Cooperation to Improve North Korean human Rights Condition under the Kim Jong-Un Regime, Korea Institute of National Unification, Seoul Korea

2012 *Program director,* Forum, Grassroots Humanitarianism: health aid via self-governance, organized by Self-Governance Association of Korea, Seoul Korea

2012 *Program director,* Public Lecture Series: Humanity and Humanitarianism, organized by Wellcome Unit for the History of Medicine, University of Oxford,

2012 *Principal-organizer*, Round Table: International Cooperation Strategy for promoting North Korea Human Rights, Korea Institute of National Unification, Human Rights Watch, New York, United States

2010 *Co-organizer*, Conference: Health and Human Rights: North Korea in Transition, Korean Institute of National Unification, Ministry of Unification, and the London School of Hygiene and Tropical Medicine, London, United Kingdom * LSHTM Panel includes M. Mckee; E. Sondorp, C. Zimmerman etc.

2010 *Principal Organizer*, KPI International Forum: Refugee Trauma and Psychosocial Intervention, Korea Peace Institute (KPI), Seoul Korea

2010 *Principal Organizer*, Psychosocial Forum: North Korean Refugee Children and Adolescent in South Korean Education System, College of Medicine, Yonsei University, Seoul Korea

2010-11 *Co-organizer,* Professional Certification Course for Emergency Preparedness, Joint program of Graduate school of public health, Yonsei University and the Centre for Refugee and Disaster Response at Johns Hopkins University. *2011 Course*: International Development in Health; *2010 Course*: Global Disaster Response. * Invited lecturers from University of Oxford; Harvard Medical School; Johns Hopkins Bloomberg School of Public Health; MSF, UNHCR Korea, Mercy Corps, USAID

2010-11 *Principal-organizer,* Joen Lecture Series (Monthly Program): a humanitarian medicine and disaster preparedness training program for health professionals and NGO/GO workers in Korea, Seoul, Korea. *Invited lecturers from University of Oxford; Harvard Medical School; Johns Hopkins Bloomberg School of Public Health; MSF, UNHCR Korea, Mercy Corps, USAIDs

Policy Paper/Practice-Related Report/Conference Paper:

Policy Paper and Practice-Related Reports (based on original research)

1. Cha J , Kim J. Lee H. Lopes Cardozo B. (2015) *An Integrative Study of North Korean Refugee Trauma and Human Rights Abuse in North Korea: a cross-sectional, retrospective study of North Korean refugees and staff working in South Korea*, a joint report of Korea Institute for National Unification, Seoul, South Korea and Centers for Disease Control and Prevention (CDC), Atlanta, United States
2. Kim H, Cha J, Lee H, Kim TY, Robinson C (2015) *Ethnic Minorities and North Korean Refugees Results from a Site Assessment and Psychosocial Support for Left-Behind Children of in Heilongjiang Province: Recommendations for a Pilot School-Based Intervention*, Submitted to United Nations High Commissioner for Refugees (UNHCR), Geneva, Switzerland
3. Robinson C, Kim TY, Cha J, Lee H, Lee K. (2014) *Population Estimation of North Korean Refugees and Migrants and Children Born to North Korean Women in Northeast China: Results from a 2013 Study in the three provinces of Liaoning, Jilin and Heilongjiang*. Submitted to the Korean Institute for National Unification (KINU). Seoul, Korea.
4. Robinson C, Kim TY, Cha J, Lee H, Lee K. (2013) *Population Estimation of North Korean Refugees and Migrants and Children Born to North Korean Women in Northeast China: Results from a Study in Heilongjiang Province*. Submitted to the Korean Institute for National Unification (KINU). Seoul, Korea.
5. Lee H, Cha J, Park S. (2012) *A study for quality evaluation in health system in North Korea, Seoul National University Hospital*, submitted to Institute for Peace and Unification Studies, Seoul National University, South Korea
6. Cha J. (2012) *Chapter: A case analysis of US humanitarian aid system in Humanitarian Aid Policy* in a Report of Bilateral Emergency Aid System, co-authored, (PI. M. Lee), A mid-term report Submitted to The Korea International Cooperation Agency (KOICA), South Korea
7. Cha J (2011) *Securing humanitarian space: analysis report of humanitarian strategy to North Korea*, Submitted to the Médecins Sans Frontières (MSF), Switzerland
8. Cha J (2010) *Access to healthcare for North Korean refugees in China*, Submitted to the Médecins Sans Frontières (MSF), Switzerland
9. Kim J, Cha J, Lee J (2008): *Review of Trafficking among North Korean in China*, Submitted to International Organization for Migration (IOM), for Bureau of Population, Refugee and Migration, United States Department of State. United States

Conference Papers

1. Cha J (2016) *Social epidemiology of human rights violations in North Korea : A retrospective study of recently displaced North Korean refugees and migrants in South Korea*, Human Rights Research for Public Health Promotion, Human Rights Forum, 144nd APHA Annual Meeting and Exposition, American Public Health Association (APHA), Denver, United States

2. Lee H and Cha J (2016) *From collective to interpersonal violence: a study of intimate partner violence among North Korean refugees exposed to human rights violations in North Korea*, Displaced populations & refugee health, International Health, 144nd APHA Annual Meeting and Exposition, American Public Health Association (APHA), Denver, United States

3. Cha J (2014) *Health disparities in black market transition of health system in North Korea*, Politics, Policy and Health, Socialist Caucus, 142nd APHA Annual Meeting and Exposition, American Public Health Association (APHA), New Orleans, United States

4. Cha J (2014) *Discussion Paper: human rights indicator for monitoring North Korea*, Strategies for international cooperation after United Nation Commission of Inquiry on DPRK, the 4th Challot Human Rights Forum 2014: North Korean Human Rights and Happiness for a United Korea, Korea Institute of National Unification Seoul Korea
5. Cha J (2013) *Lesson learned from disaster response and refugee program* Symposium: Global Collaboration for Injury Control and Disaster Medical Services in Pan-Asian Country, Hosted by Laboratory of Emergency Medical Services, Seoul National University Hospital Biomedical Research Institute and by the JW Lee Center for Global Medicine, Seoul National University College of Medicine, South Korea
6. Cha J (2012) *Health and Humanitarian aid in post-socialist transition in North Korea*, North Korea Watchers Symposium, co-organized by United States Department, US embassy in Seoul and UK embassy in Seoul, South Korea
7. Cha J (2012) *Rights to health in post-socialist transition in North Korea*, Symposium: Health and Human Rights in North Korea, University of Oxford. Oxford, United Kingdom 2012
8. Cha J (2012) *Discussion Paper: Humanitarian Aid form Non-Western actors* Emergency Relief and beyond: humanitarian assistance and international development, Save the Children. Seoul Korea
9. Cha J (2012) *Grassroots Humanitarianism from Korea*, Peace Symposium: Humanitarian View from Peace, Korea General Assembly, Seoul, Korea 2012
10. Cha J (2012) *Human Rights Based Humanitarian assistance to North Korea*, International Forum, North Korea: Beyond Human Rights and Humanitarianism, Yonsei University, Seoul, 2012
11. Cha J (2012) *Rights to Health in North Korea*, International cooperation to Improve North Korean human rights condition under the Kim Kong-Un Regime, Korea Institute of National Unification, Seoul, Korea
12. Cha J (2011) *Integrating Legal and Health Service for Urban Refugee and Asylum Seeker in South Korea, Disaster Management*, The 43rd Asia-Pacific Academic Consortium on Public Health (APACPH) Conference, Seoul, Korea
13. Cha J (2011) *Humanitarian view from Asia*. How legitimate is medical humanitarian action, The 2011 Autumn Conference of Korean Society of Medical Ethics Seoul, South Korea Oct 2011
14. Cha J (2011) "Primary Healthcare in Humanitarian emergency," The 2011 Spring Conference of Korean Family Medicine Association, Seoul, South Korea
15. Cha J (2007) *The integrated proposal for mental health care of Dislocated North Korean.* Section, Psychiatric care system for the Dislocated North Koreans, A Symposium*,* The 2007 Autumn Conference of Korean Neuropsychiatric Association, Seoul, South Korea

SEMINARS AND CONFERENCE PRESENTATIONS

1. Speaker, "Social epidemiology of human rights violations in North Korea : a retrospective study", Human Rights Research for Public Health Promotion Session, Human Rights Forum, 144nd APHA Annual Meeting and Exposition, American Public Health Association (APHA), Denver, United States 2016
2. *Speaker*, "Health Disparities in black market transition of health system in North Korea", Politics, Policy and Health, Socialist Caucus, 142nd APHA Annual Meeting and Exposition, American Public Health Association (APHA), New Orleans, United States, 2014
3. *Speaker*, "Humanitarian Implication of Social Change in North Korea: a case of health system transition", Humanitarian cooperation in DPRK, Green Templeton College, University of Oxford, Oxford, United Kingdom., 2014

4. *Invited Panelist*, Strategies for international cooperation after United Nation Commission of Inquiry on DPRK, the 4th Challot Human Rights Forum 2014: North Korean Human Rights and Happiness for a United Korea, Korea Institute of National Unification Seoul Korea 2014
5. *Speaker,* "Lesson learned from disaster response and refugee program", Symposium: Global Collaboration for Injury Control and Disaster Medical Services in Pan-Asian Country, Hosted by Laboratory of Emergency Medical Services, Seoul National University Hospital Biomedical Research Institute and by the JW Lee Center for Global Medicine, Seoul National University College of Medicine, South Korea 2013
6. *Speaker*, "Health and Humanitarian aid in post-socialist transition in North Korea", North Korea Watchers Symposium, co-organized by United States Department, US embassy in Seoul and UK embassy in Seoul, South Korea 2012
7. *Speaker*, "Rights to health in post-socialist transition in North Korea", Symposium: Health and Human Rights in North Korea, University of Oxford. Oxford, United Kingdom 2012
8. *Invited Panelist,* Emergency Relief and Beyond: humanitarian assistance and international development, Save the Children. Seoul Korea 2012*,*
9. *Speaker*, "Grassroots Humanitarianism from Korea", Peace Symposium: Humanitarian View from Peace, Korea General Assembly, Seoul, Korea 2012
10. *Speaker*, "Human Rights Based Humanitarian Assistance to North Korea", International Forum, North Korea: Beyond Human Rights and Humanitarianism, Yonsei University, Seoul, 2012
11. *Speaker*, "Rights to Health in North Korea, Challot Forum: International Cooperation to Improve North Korean human rights condition under the Kim Kong-Un Regime' Korea Institute of National Unification, Seoul, Korea Jun 2012
12. *Speaker*, "United Nation's human rights intervention to North Korea", Advisory Meeting, Center of North Korean Human Rights Studies, Korea Institute of National Unification, Seoul, Korea Apr 2012
13. *Speaker*, "Public health strategies to North Korea", Advisory Meeting, Center of North Korean Human Rights Studies, Korea Institute of National Unification, Seoul, Korea Mar 2012
14. *Speaker*, "Health and Human Rights in North Korea", Advisory Meeting, Center of North Korean Human Rights Studies, Korea Institute of National Unification, Seoul, Korea Dec 2011
15. *Speaker*, "Integrating Legal and Health Service for Urban Refugee and Asylum Seeker in South Korea, Disaster Management, The 43rd Asia-Pacific Academic Consortium on Public Health (APACPH) Conference, Seoul, Korea Oct 2011
16. *Speaker*, "Humanitarian view from Asia," How legitimate is medical humanitarian action, The 2011 Autumn Conference of Korean Society of Medical Ethics Seoul, South Korea Oct 2011
17. *Speaker*, "Primary Healthcare in Humanitarian emergency," The 2011 Spring Conference of Korean Family Medicine Association, Seoul, South Korea Mar 2011
18. Speaker, "Health consequences of Recent Socioeconomic Transition in North Korea", Conference: *Health and Human Rights: North Korea in Transition*, Korean Institute of National Unification, Ministry of Unification, and the London School of Hygiene and Tropical Medicine, London, 16 December, 2010
19. *Speaker,* "Psychosocial Understanding on North Korean refugee children in China", *KPI International Forum: Refugee Trauma and Psychosocial Intervention,* organized by Korea Peace Institute (KPI), Seoul, South Korea, Sep. 2010
20. *Invited Speaker*, "Dilemmas of Humanitarian Practice in Refugee Health" presentation to, *The Journey to better health:* A Symposium, organized by Global Health Forum, Seoul National University; Center for Refugee and Disaster Response, Johns Hopkins Bloomberg School of Public Health. Jan 2010.

21. *Invited Speaker*, "The integrated proposal for mental health care of Dislocated North Koreans," presentation to, *Psychiatric care system for the Dislocated North Koreans: A Symposium,* The 2007 Autumn Conference of Korean Neuropsychiatric Association, Seoul, South Korea. Oct 2007
22. *Invited Panelist*, Government centered Resettlement Policy for the Dislocated North Koreans; issues of handover from Ministry of unification to local agencies*:* a Policy Symposium, organized by Kyounin Developmental Institute and Citizens Alliance for North Korean Human Rights, South Korea. Dec 2007
23. *Invited panelist*, Health care management program for dislocated North Koreans: An inter-agency conference, Korean Center for Control and Prevention, Seoul, South Korea. Jun 2007

INVITED LECTURES

1. *Invited Lecturer*, "Politics of refugee health", Global Health Forum, Seoul National University Seoul South Korea 2016.
2. *Invited Lecturer,* "North Korean Refugee Health Seminar", Graduate School of Public Health, Yonsei University Seoul, South Korea 2015
3. *Invited Lecturer, "*Politics of Refugee Trauma", the 34th colloquium, The institute of Humanities for Unification, Dankuk University, Seoul, South Korea 2014
4. *Speaker, "*Introduction to North Korea Crisis in Transition", Korea-Japan Fair, John Hopkins Bloomberg School of Public Health, Baltimore, United States, 2013
5. *Lecturer,* "Integrated understanding for health and psychosocial vulnerability of Left-behind Children in China"; "School based Evaluation of Health Accessibilities of Left-behind Children", Psychosocial workshop for left-behind Children in Northeast China, Department of Education, The Provincial government of Heilongjiang, Harbin, China. 2012
6. *Invited Lecturer,* "Ethical Dilemma of Humanitarian Practice in Protracted Refugee Setting", School of Public Health, Yonsei University, Seoul, Korea. 2012
7. *Invited Lecturer,* "District Health System Strengthening: a case study of Papua New Guinea", School of Public Health, Yonsei University, Seoul, Korea. 2012
8. *Invited Lecturer,* "Urban Refugee Health", School of Public Health, Yonsei University, Seoul, Korea. 2012
9. *Invited Speaker*, "North Korean Health in Post-socialist transition", the Center for North Korean Human Rights Studies, Korea Institute of National Unification. 2012
10. *Lecturer,* International Development in Health*, Joint program* of Yonsei graduate school of public health and the Center for Refugee and Disaster Response at Johns Hopkins School of Public Health, MEDIPEACE, Seoul, Korea. 2011
11. *Invited Lecturer*, Refugee Health, Kyoungdong University 2011
12. *Invited Lecturer,* "Practice in Health Programming", School of Medicine, Yonsei University, Seoul, Korea. 2010
13. *Invited Lecturer,* "Psychosocial Interventions in Complex Emergency", Graduate School of Public Health, Yonsei University, Seoul, Korea. 2010
14. *Invited Lecturer,* "Definition of Disaster, Refugee and other Humanitarian Crisis", Graduate School of Public Health, Yonsei University, Seoul, Korea 2010
15. *Invited Lecturer,* "Humanitarian Intervention in Global Health", School of Medicine, Yonsei University, Seoul, Korea. 2010

16. *Lecturer,* International Disaster Response: Professional Course, Joint program of Yonsei graduate school of public health & Center for Refugee and Disaster Response, Johns Hopkins School of Public Health, Seoul, Korea. 2010
17. *Invited Lecturer,* "Development Strategies for Global Health area", School of Medicine, Catholic University, Seoul, Korea. 2010
18. *Invited Lecturer,* "Humanitarian Practice in Refugee Health", Medipeace Joen lecture series, Ewha University, Korea. 2010
19. *Invited Lecturer,* "Humanitarian aids in health", School of Medicine, Yonsei University, Seoul, Korea. 2010
20. *Invited Lecturer,* "Biosocial Health in definition", The United Relief and Community Development Foundation, Beijing, China. 2009
21. *Invited Lecturer,* "Conceptual approach of Health in humanitarian aids", The United Relief and Community Development Foundation, Bangkok, Thailand. 2009
22. *Invited Lecturer,* "North Korean's migration in vulnerable condition and its psycho-social impact," Oxford Korea society seminar, Oxford University, Oxford, UK, 2009)
23. *Lecturer (Health Educator),* "Reproductive health in Refugee", the health education programs for North Korean refugee, The Settlement Support Center for Dislocated North Koreans (Hanawon), Ministry of Unification, South Korea. 2005- 2008 (12 courses per year)
24. *Lecturer (Health Educator)*, "Chronic pain and psychosomatic disorder in Refugee," the health education programs for North Korean refugee, The Settlement Support Center for Dislocated North Koreans (Hanawon), Ministry of Unification, South Korea. 2005- 2008 (12 courses per year)
25. *Lecturer (Health Educator)*, "Health care system in South Korea," the health education programs for North Korean refugee, The Settlement Support Center for Dislocated North Koreans (Hanawon), Ministry of Unification, South Korea. 2005- 2008 (12 courses per year)

HONORS AND AWARDS

Rotary Foundation International Ambassadorial Scholar 2008

Special EKF Scholarship, the Euro Korean Foundation, 2008

Minister's Honor, Ministry of Unification, 2007

The President of the Korean Medical Association Award, 2005

MEMBERSHIPS

Member, Médecins Sans Frontières, Korea

Member, American Public Health Association

Member, Korean Medical Association

Member, Korean Association for Philosophy of Medicine

ADDITIONAL INFORMATION

Reference

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